

Consumers' Research Specializes In Criticism but 'Can't Take It'

Threaten Suit Because Of July 4 Editorial

Cadwalader, Wickersham & Taft (Strong & Cadwalader)

George W. Wickersham
Henry W. Taft
Francis Smyth
W. L. Mitchell
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George Coghill
Walbridge S. Taft
Robert Le Roy
De Coursey Fales
Sidney P. Henshaw
Thomas B. Gilchrist
Merrill M. Manning
F. Sims McGrath
R. Keith Kane
John G. Boston

Edward J. Hancy

Mr. F. M. Cockrell, President,
Business News Publishing Co.,
Re: Consumers' Research, Inc.

Dear Sir:

Our client, Consumers' Research, Inc., has drawn to our attention the issue of July 4, 1934, of "Electric Refrigeration News," in which issue, on page 8 thereof, you have a lengthy article with respect to Consumers' Research material.

Your naivety with respect to the confidential nature and protection of the material of Consumers' Research, Inc., is indeed surprising and, at the same time, arrogant. We must impress upon you the following well-defined legal principles.

The material of Consumers' Research, published in its Hand Book of Buying is, in the first place, copyrighted and, therefore, any repetition of material contained therein by another person, either in form or in toto or in part, is an infringement of the copyright and subject to a right of action for damages. Secondly, material published in such Hand Books is given only to subscribers of Consumers' Research, Inc., who request the Hand Books upon the signing of a contract whereby the subscriber promises to keep the material in question confidential. Therefore, whenever a subscriber publishes the material in question to another, it is a violation of the subscriber's contract and, in fact, an infringement of the property rights of Consumers' Research, Inc.

Obviously we will not and do not intend to tolerate such an example of bad faith and infringement of fundamental principles as appears in your issue of July 4, 1934.

Will you kindly give us the name of the subscriber who has given you your information. If you do not care to give us this information, we have other means of discovering it.

You will kindly refrain at once from such conduct as that of which you have been guilty, and you will also please give us at once your assurance that you will so refrain. We do not intend to have lengthy correspondence with you on the right or wrong of the matter, as the principles are clearly enough defined to demand immediate action. If you do not wish to recognize such principles there is only one course for us to take.

Very truly yours,

CADWALADER, WICKERSHAM & TAFT.

They Quote Us But Don't Want To Be Quoted

On July 4, 1934, Electric Refrigeration News published an editorial in which information was given and opinions were expressed regarding the activities of Consumers' Research, Inc., an organization which has undertaken the job of informing the public regarding the merits, or demerits, of a wide variety of products, including electric refrigerators.

The editorial dealt particularly with a recent publication of Consumers' Research, Inc., in which refrigerant gases were discussed. The impression was conveyed in the bulletin that important information regarding the dangers of these refrigerants was being given to subscribers of Consumers' Research, that such information was not available to the public generally, and that manufacturers of electric refrigerators had succeeded in preventing newspapers from informing the public regarding the facts about these refrigerants.

It is important to note that in this bulletin of Consumers' Research, Inc., it was asserted that certain facts regarding refrigerant gases had been obtained from ELECTRIC REFRIGERATION NEWS. It was apparently the intention to convey the impression that the statements made were authoritative because of the fact that the information had been obtained from this publication.

It should also be noted that ELECTRIC REFRIGERATION NEWS is a copyrighted publication and that no permission has been given to Consumers' Research, Inc. to copy or republish any

of the material therein. ELECTRIC REFRIGERATION NEWS took exception to the use, or misuse, of the material in its columns. It seemed to be a fair and reasonable proposition to us that if Consumers' Research, Inc. could assume the right to extract material from our copyrighted publication and express opinions regarding the information so secured, then that we had an equal right to inform our subscribers regarding the manner in which this material was being used and to express our opinions regarding the information being distributed to the public.

In brief, what is fair for one should be fair for the other.

It appears, however, from the letter of the Wall Street attorneys that they are not interested in discussing "the right or wrong of the matter." We therefore requested information from the Register of Copyrights as to whether it is legally consistent for a publication to be both copyrighted and confidential at the same time.

An Inquiry to the Register of Copyrights

July 27, 1934.

Library of Congress
Copyright Office
Washington, D. C.

Will you please inform us regarding the following:

Does the principle of "disclosure" as applied by the Patent Office also hold for a copyrighted publication? In other words, is it necessary for an author to "disclose" his publication in order to secure copyright privileges?

Specifically, we would like to know whether an author may claim the protection of copyright for his publication and at the same time claim the common law right protecting a *confidential manuscript*? Stated another way, may a publication be both copyrighted and confidential at the same time?

Our interest in this matter is due to a complaint received from attorneys for Consumers' Research, Inc., of Washington, N. J., who claim that we have violated their copyright by publication of the attached editorial. They claim that this publication is copyrighted and that it is also confidential and we are anxious to know whether these two claims are consistent.

F. M. COCKRELL.

A Published Work Is Given to the Public

Library of Congress
Copyright Office
Washington, D. C.

Aug. 2, 1934.

Business News Publishing Co.

In response to your letter of July 27, we beg to say that in order to secure copyright for a printed publication, it is necessary to publish it with the statutory notice inscribed on the copies. The copyright law defines the date of publication as "the earliest date when copies of the first authorized edition were placed on sale, sold, or publicly distributed by the copyright proprietor or under his authority." It is difficult to see therefore how a work can be published in this statutory sense of the term and at the same time be held secret or confidential. When once a work is published, the information is given to the public, but the form in which it is presented may be the subject of copyright so as to prevent others from reproducing the literary or compiled material without consent.

Registration is found in the name of Consumers' Research, Inc., for *Handbook of Buying*—Vol. 9, Part 3 (the date of publication being given as May 14, 1934).

W. M. L. BROWN,
Register of Copyrights.

We have also obtained competent legal advice on this point. Our attorney explains the law and cites judicial decisions as follows:

Is It Possible for a Copyrighted Publication To Be Confidential?

In answering this question it becomes necessary to show that the word "confidential," as used in connection with publication, has two aspects in the law. A communication may be made confidential between parties with the intent that the information received, for greater profit to one party or the other, shall not further be published or republished; or it may be made confidential with the intent that the information, of possibly libelous nature, is transmitted

only as a matter of personal privilege and at the request of the one seeking the information. Requests for credit ratings fall into this latter category.

A copyrighted publication, by express contract between the copyright owner and a subscriber, may be confidential as first above defined so as to expose the subscriber to a suit for damages if the contract is breached. Such copyrighted publication may not, however, by contract or otherwise, be of a confidential nature in the sense that it will protect the copyright owner from the possibility of having to respond in damages for the possible libelous nature of the matters thus confidentially disclosed. The very essence of copyrighting is the registry of at least two copies of the publication to be protected, which registry is open to the public for inspection and precludes the idea as well as the possibility of limited or confidential publication as last above defined.

At common law, a writer's creation is his property in the same sense that one owns furniture or other personalty, but only until a general publication is made thereof, upon which the matter is dedicated to the public. Such intellectual production may be published, however, in a qualified or limited manner, or by a restricted circulation, without destroying or abridging the larger right of common law ownership and of first publication.

General publication under common law deprives the owner of the benefit of copyright statutes, and conversely copyrighting destroys every right of restricted publication which might have been enjoyed under the common law.

"There can be no limited or restricted publication under a copyright; any publication under copyright is a general publication destroying all common-law rights." 13 Corpus Juris 978, citing *Bobbs-Merrill Co. vs. Straus*, 147 Fed. 15, 77 C.C.A. 607, 15 L.R.A. U.S. 766 (affirmed in 139 Fed. 155 and affirmed 210 U.S. 339, 28 Supreme Court 722, 52 L. Ed. 1086).

Further, while by contract information may be made confidential between a publisher and a subscriber, it is also true that if the contract is breached and the matter is communicated to third parties, these latter, though possibly liable for infringement on copyright, are not liable in damages for the breach because as to them there is no privity of contract.

What Is Infringement Of a Copyright?

Neither the use of quotes nor acknowledgment of the source can constitute redemption from what is otherwise infringement of the right conferred by statute upon the copyright owner.

The general right so conferred is the exclusive right to print, reprint, publish, copy and vend the copyrighted work. Additional rights are conferred in certain arts, not incident to the news publishing field.

While these rights have been enumerated by statute, Congress has left the question of what constitutes infringement largely to judicial construction. Unlike a patent right, a copyright contemplates and permits fair use by all persons of the copyrighted work. Facts, theories, speculation, ideas and opinions are not covered by the copyright of the publication in which they are expressed, and their adoption and use is not an infringement. Court decisions too numerous to cite uphold this rule. It is the copying or paraphrasing of a work which constitutes the possible infringement. In determining the question, the amount of matter copied is an important consideration, and whether or not the value of the original is thereby sensibly diminished. The quality of the material and its relative importance to the whole is also of importance, together with the question of how much work has been saved the defendant by his use of the other's material.

The whole question seems to resolve itself into what constitutes unfair use. If it tends to supplant and thereby diminish the value of the original work, certainly the direct copy is an infringement. On the other hand, a copyrighted work and the thoughts therein contained are not thereby made unavailable to workers in the same field and some use of it may be made, as otherwise the promotion of arts and sciences would be hindered rather than promoted by the privilege of copyright.

But the use of it must be subject to the general limitation that it must not encroach upon and supplant the usefulness of the original work and must be for a fair, legitimate and reasonable purpose, such as for illustration, comment, criticism and the like.

Judicial Decisions On Copyright Law

If extracts and quotations are taken for the purposes of criticism, comment, or illustration, considerable license is allowed, for the selection of extracts for such purposes, so far from being injurious, is often bene-

ficial to the sale of the book from which they are taken."—13 Corpus Juris, 1127.

"When a copyrighted book is published and sold, however, something is necessarily given to the purchaser and acquired by the general public. One thing acquired is the fact that the author has expressed certain thoughts. This is a fact in literature of which any one is free to avail himself as he is of any fact made public. It can be commented upon and discussed and the author's work reproduced so far as to make the comments intelligible."—*Ginn vs. Apollo Pub. Co.*, 215 Fed. 772, 778.

"One test which, when applicable, would seem to be ordinarily decisive, is whether or not so much has been reproduced as will materially reduce the demand for the original. If it has, the rights of the owner of the copyright have been injuriously affected.

"A word of explanation will be necessary. The reduction in demand, to be a ground of complaint, must result from the partial satisfaction of that demand by the alleged infringing production.

"A criticism of the original work, which lessened its money value by showing that it was not worth seeing or hearing, could not give any right of action for infringement of copyright.

"A copyrighted work is subject to fair criticism, serious or humorous. So far as is necessary to that end, quotations may be made from it, and it may be described by words, representations, pictures, or suggestions. It is not always easy to say where the line should be drawn between the use which for such purposes is permitted and that which is forbidden."—*Hill vs. Whalen*, 220 Fed. 359, 360.

"Notwithstanding the language of the Act, not every verbatim reprint of part of a book is an infringement of copyright. In the words of Lord Hatherley in *Chatterton vs. Cave*, 3 App. Cas. 483, 492: 'Books are published with an expectation, if not a desire, that they will be criticised in reviews, and if deemed valuable that parts of them will be used as affording illustrations by way of quotation, or the like—and if the quantity taken be neither substantial nor material, if, as it has been expressed by some judges, "a fair use" only be made of the publication, no wrong is done and no action can be brought.'—*Warne vs. Seebom*, 39 Ch. D. 73, 79, 7 E.R.C. 98.

Good or innocent intentions may bear upon the question of fair use, and excuse an invasion of copyright, but where one, with the intent to save himself labor, takes all or a part of a previous work, the question of fair use is thereby rebutted and affords no defense to an action for infringement.

Suggestions to Advertisers

Features of Coming Issues of Electric Refrigeration News

Aug. 15—Commercial Installations

Editorial: To contain detailed "how-it-was done" information on, and pictures of, recent installations of refrigeration equipment in food marketing and food serving establishments.

Advertising: An effective issue for the advertising of compressors, cooling coils, valves, controls, motors, display cases, insulation, refrigerants, dehydrators, receiving tanks, as well as the principal applications of commercial refrigeration to beer cooling, milk cooling, soda fountains, counter ice cream freezers, ice makers, etc. Advertising forms close Aug. 11.

Aug. 22—Service Manual

Editorial: Authoritative, practical articles and charts on how to service faulty seals, expansion valves, controls and motors. Detailed instructions for servicing an "orphan" refrigerator. A treatise on how cabinets and finishes are repaired.

Advertising: This issue will have extra distribution among service companies and will constitute an unusually fine opportunity for the advertising of replacement parts bought and used in installation and servicing of mechanical refrigerators such as expansion valves, float valves, fittings, seals, cold controls, motors, filters, dehydrators, belts, gaskets, pistons, piston rings, refrigerants, porcelain patching cement, as well as tools and equipment used in installation and servicing such as dehydrating ovens, blow torches, leak detectors, tube cutters and benders, wheel pullers, flaring tools, special wrenches, testing instruments, refrigerator carriers, covers, slings, and harness, etc. Advertising forms close Aug. 18.

Aug. 29—Air Conditioning

Editorial: Detailed reports of how particular installations have been made, accompanied by pictures and diagrams, and emphasizing features which individualize each job, based on practical experience with actual installations.

Advertising: This issue will have special reader interest to those distributors and dealers now selling or contemplating the sale of air conditioning equipment—another extra advertising value to manufacturers of air conditioning equipment and accessory products, such as compressors, cooling coils, valves, grilles, fans and blowers, controls, motors, filters, air washers, etc. Advertising forms close Aug. 25.

Sept. 5—Orphan Machines

Editorial: Revised list of orphan electric refrigerators with all available information regarding each defunct concern, and the disposition of its patents, patterns, stock of parts, etc.

Advertising: Dramatic background for well-established refrigerator manufacturers to impress the industry with the value of their stability. A rare opportunity for specialists in replacement parts to list the brands and models which they are prepared to service. Advertising forms close Sept. 1.

Sept. 12—Commercial Specifications

Editorial: Complete specifications on all compressors for commercial refrigeration appliances including new machines brought out since the publication of last set of commercial machine specifications in March 14 issue of ELECTRIC REFRIGERATION NEWS.

Advertising: Of unusual interest and value to every manufacturer, distributor, dealer and salesman of commercial refrigeration. There will be a big demand for extra copies. This issue will have the more than usual advertising value to any manufacturer interested in the commercial refrigeration market. Advertising forms close Sept. 8.

Sept. 19—Inside the Refrigerator

Editorial: A pictorial display showing the inside of the leading designs of refrigerator cabinets now on the market, with captions emphasizing differences in arrangement and fittings. An article will discuss the art of interior decorating as applied to refrigerator cabinets.

Advertising: A particularly fine background for the advertising of refrigeration accessories, such as shelving, egg or fruit baskets, vegetable fresheners, food dishes, water bottles, odor absorbers, ice cube trays, ice cream freezers, lighting fixtures, ice cube crushers, thermometers, etc. Advertising forms close Sept. 15.

REFRIGERATION NEWS

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS. MEMBER PERIODICAL PUBLISHERS INSTITUTE.

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Business News Pub. Co.

DETROIT, MICHIGAN, AUGUST 15, 1934

Entered as second-class
matter Aug. 1, 1927THREE DOLLARS PER YEAR
TEN CENTS PER COPYCode Authority
For Machinery
Group SelectedRefrigerating Machinery
Authority Headed
By McNaught

WASHINGTON, D. C.—Personnel of the code authority elected by the refrigerating machinery industry to administer its code of fair competition was announced last week by the NRA.

S. E. McNaught of York, Pa., is chairman. Other members include:

A. H. Baer, executive vice president, Carbondale Machine Co.; D. Norris Benedict, vice president and general manager, Frick Co., Inc.; J. M. Fernald, general manager, Baker Ice Machine Co., Inc.; G. A. Heuser, secretary and treasurer, Henry Vogt Machine Co.; J. I. Lyle, president, Carrier Corp.; F. M. Roessing, Roessing Mfg. Co.; W. S. Shipley, president, York Ice Machinery Corp.; Emil Vilter, president, The Vilter Mfg. Co.

William E. Henderson is to be secretary-treasurer of the code authority, which will have its offices in the Southern building, Washington, D. C.

Kelvinator Brings Out
Boiler-Burner

DETROIT—In collaboration with Kewanee Boiler Corp., a division of American Radiator Co., Kelvinator Corp. engineers have produced a self-contained automatic heating device for domestic use that comes an integrally designed steel heating boiler with an automatic oil burner.

The new boiler-burner will retail for less than any similar device now on the market, Kelvinator officials say. The unit is adaptable to both hot water and steam applications. Provision has also been made for installation of an automatic hot water heater at additional cost.

With a capacity of 420 to 600 sq. ft. of steam capacity (hot water, 670-960 sq. ft.), the unit, which will be known as model KBL, heats homes of from five to eight rooms. The heater weighs 736 lbs. complete, and has a height of 42½ in.; length of jacket, 46 in.; length including burner and smoke hood, 61 in.; width, 20½ in.

Consumption of fuel oil—A.O.B.A. No. 1, 2, or 3—ranges from .85 to 1.32 gal. per hour. The boiler is of welded steel construction, and employs principles ordinarily limited to high-pressure industrial installations. The burner unit is basically of the high-pressure, atomizing variety, and is located in an out-of-the-way position at the rear of the heater immediately below the smoke hood, to enhance the unit's appearance and economize on usable floor space.

The unit is operated by a ½-hp. 60-cycle motor, 110 volt, a.c. Ignition is of the continuous electric spark type. The KBL's jacket is built of welded steel, insulated with asbestos board, finished in blue lacquer trimmed with polished chromium plating.

Ice Rates Are Set for
New Orleans Area

WASHINGTON, D. C.—National Recovery Administrator Hugh S. Johnson announced on Aug. 9 he had signed an order declaring an emergency to exist in the ice industry in the competitive area comprising the parishes of Orleans, Jefferson, and Saint Bernard, Louisiana. The cause assigned was given as destructive price cutting due to excessive over-production.

It was ordered that for a period of 90 days from Aug. 8, 1934, no member of the industry shall sell, or cause to be disposed of, ice at a price lower than the following applicable rates:

Class A: Wholesale and heavy commercial (wholesale being defined as sales of ice to be re-sold and heavy commercial as sales of 600 lbs. or more to be delivered for use in connection with the business of the buyer), \$3.60 per ton.

Class B: Light commercial (sales of less than 600 lbs.), 28 cents per 100 lbs.

Class C: Domestic, at platform, 36 cents per 100 lbs. Delivered, 40 cents per 100 lbs.

Ice Cabinets May
Have Labels to
Show Capacity

WASHINGTON, D. C.—Household ice refrigerators henceforth will bear a "standard label" showing the usable cubic feet of storage space, the rated shelf area in square feet, and the rated ice capacity in pounds if a series of amendments proposed to the code of competition for manufacturers of household ice refrigerators is approved by the National Recovery Administration.

Public hearings on the proposed amendments will be held Friday, Aug. 17, in the Department of Commerce auditorium here with Deputy Administrator Neal W. Foster presiding.

Another important amendment provides for selling below cost to meet the lower price of a competitor whose price does not violate the provisions of the code for products of equivalent type, quality, and performance.

If the amendments are approved, the "open price" provision of the code whereby members file price lists which will be available immediately to all other members of the industry will conform to the NRA's current standard "interpretation" of this provision, which is a part of many codes.

When any member of the industry files a revision of his price list, he will not be able to file a higher price within 48 hours, if the amendment is approved.

Other amendments provide for the setting up of a uniform system of costing and accounting.

With respect to work hours, the amendments declare that no employee shall be permitted to work in excess of 40 hours in any one week or eight hours in any 24-hour period, except as otherwise provided.

To provide for peak production periods, one amendment reads:

"In order to provide for peak production periods, plant and factory employees may, during any eight weeks in each calendar year, be permitted to work up to but not in excess of 48 hours in any week or eight hours in any day, provided, however, that such time worked in excess of 40 hours in any such week by such employees shall be paid for not less than 1½ times the normal rate of pay."

Allied Store Appoints
Two Distributors

ST. LOUIS—Two new distributors have been appointed by the Allied Store Utilities Co., manufacturer of Hussmann-Ligonier refrigerators here.

E. J. Arnold, with headquarters at 437 Broadway, Buffalo, N. Y., is the new distributor for that territory, and George J. Fischer & Sons, 22 Lapeer St., Saginaw, Mich., has taken on the Hussmann line there.

A. L. Kress, formerly deputy administrator of the rubber industry codes, is director of the new division.

New Frigidaire Units at Work



Frigidaire "flowing cold" units find an application in the vegetable storage room of Kramer Bros., wholesale produce house on Chicago's South Water Market. The management declares the forced-draft system of cooling is especially effective in refrigerating crated products.

Refrigeration Is
Put to Variety
Of Uses at FairCommercial Systems Fewer
This Year; Minimum of
Service Required

By John T. Schaefer

CHICAGO—Commercial refrigeration plays the role of a highly important, though unobtrusive utility at A Century of Progress where thousands of daily visitors must be fed and refreshed after tramping through the myriad exhibits of Chicago's "big show."

All the common commodities requiring refrigeration are being cooled at the Fair—water, beer, ice cream, salads, soda fountain mixtures, milk, meats, vegetables—and in addition, a number of commercial systems are serving special purposes in the agricultural, meat packing, and engineering exhibits.

It is true, however, that there is less commercial electric refrigeration at the Fair this year than there was in 1933. Two reasons for this are:

First, because of the indefinite nature of the plans for the 1934 Fair last fall, a good many users of commercial refrigeration had their equipment pulled out last year, and when plans for the Fair this year materialized, they simply adopted ice (about 65 installations were removed last fall by the Chicago Refrigeration Service Co. which handles much of the installation and service work at the Fair).

Second reason for the fewer number of systems now in operation is that several concessionaires have been unable to meet their instalment payments on equipment, and the equipment has been removed for non-payment.

This state of affairs has been especially prevalent among the numerous new villages. Last year, it will be remembered, the Belgium Village made a big hit, and considerable profits for its management. So this year several ambitious entrepreneurs built more villages than the public's taste has been able to support, and (Concluded on Page 17, Column 1)

Nema Sets Up Division
To Administer Code

NEW YORK CITY—National Electrical Manufacturers Association has established a new division, the code administration department, duties of which will be to coordinate the work of the code administration with that of agencies the association represents.

A. L. Kress, formerly deputy administrator of the rubber industry codes, is director of the new division.

'Midget' Model



Charles D'Olive, sales manager of Stewart-Warner's refrigeration division, finds it easy to sit on top of the midget model.

McCray Sales Are
Better Than 1933

KENDALLVILLE, Ind.—With the end of its fiscal year coming Oct. 1, the McCray Refrigerator Sales Corp. here is running 30 per cent ahead of its last fiscal year's sales, and indications are that the company will show at least a 25 per cent increase for the entire period, according to H. M. Stewart, vice president and general manager.

At present, 225 men are working in the factory, and the office force has been increased 15 per cent within the past 90 days. Biggest jump in sales has been made in the eastern and Atlantic states.

McCray is bringing all of its salesmen to the factory this month for a series of meetings at which policies and plans for new merchandising activities will be discussed.

Krackowizer Adds to
Plant Capacity

CHICAGO—A considerable expansion of the commercial coil manufacturing capacity and experimental facilities of Refrigeration Appliances, Inc., has taken place this year, according to H. J. Krackowizer, president of the firm, and offices of the company have been air conditioned.

The air-conditioning system cools three offices from one of the company's own coils connected to a 5-ton Curtis condensing unit.

By acquisition of floor space in the basement, in the rear of the first floor, and on the second and third floors of the building in which the company is located, floor space has been tripled since the first of this year, Mr. Krackowizer estimates.

To the rear of the large room in which "Krack" fin coils are assembled, another room has been acquired for heavy machinery such as punch presses, welding machines, and for coil testing. The basement is now being used for a store-room of raw materials and partly finished products, and a new room east of the offices (Concluded on Page 24, Column 2)

Crosley Capitalizes on
Sales Record

CINCINNATI—Sales figures on Crosley "Shelvador" electric refrigerators constitute the principal copy theme in a new window banner prepared by Crosley Radio Corp. for its dealers.

In the center of the big banner, which illustrates the various Crosley models with shaded drawings, is a "box" which shows Crosley sales for various periods in large, black type.

First figure shows sales from April 1, 1932, to March 31, 1933, the total being 14,676 units.

Next figure shows that 67,237 units were sold during the period from April 1, 1933, to March 31, 1934.

For the 60-day period from April 1, 1933, to May 31, 1933, a total of 16,231 units were sold. For the same period in 1934 a total of 42,000 refrigerators were marketed.

Servel Electric
Continues Sale
Of CommercialSellman Denies Rumors
Company To Abandon
Electric Field

DETROIT—All year stories have been floating around the refrigeration industry that Servel, Inc., was going to abandon the manufacture and sale of its household and commercial electric refrigeration equipment, and confine itself to the production and distribution of Electrolux, the gas refrigerator.

These rumors gained substance

Official Denial

Servel Sales, Inc.
Evansville, Ind.

Aug. 11, 1934.

Editor:

My attention has been called to the fact that it is rumored among the trade that Servel is discontinuing its electric commercial refrigeration and air-conditioning work.

I would like to take this opportunity through your columns to deny this fact.

F. E. SELLMAN,
Vice president.Western Union Telegram
Aug. 13, 1934.F. E. Sellman
Servel, Inc.
Evansville, Ind.

Understand Servel electric commercial refrigeration and air-conditioning equipment to be sold through present distributors who will be contacted only by mail. Stores in Buffalo and Chicago to be maintained. Please confirm by wire.

GEORGE F. TAUBENECK,
Editor.Western Union Telegram
Evansville, Ind.
Aug. 13, 1934.George F. Taubeneck
Electric Refrigeration News,
Detroit

Servel electric commercial refrigeration and air-conditioning equipment will be sold through present distributors in this country and foreign markets.

F. E. SELLMAN.

when it was reported that Axel Wenner-Gren, head of the Swedish Electrolux interests (from which Servel obtained the patent rights to manufacture Electrolux refrigerators in this country), had added extensively to his holdings in Servel, Inc., and would become its board chairman.

While the electric refrigeration industry had always looked upon Electrolux as a sort of stepchild of Servel, the Swedish interests had no such notions. Electrolux was their brainchild; and, incidentally, the steady profit-maker which kept the entire Servel operation going.

Mr. Wenner-Gren, it was said, favored dropping the Servel household, commercial, and air-conditioning lines so that the company could concentrate on Electrolux. The parent company had been losing money for some time, it was reported, on its electric refrigeration lines.

When Louis Ruthenburg, former president of Copeland, and chairman and consultant of the Refrigeration Division of the National Electrical (Concluded on Page 24, Column 1)

Rex To Begin 1935
Production Oct. 1

CONNERSVILLE, Ind.—Although the Rex Mfg. Co., Inc., here is in the midst of its seasonal slump at present, preparations are being made for starting production of 1935 cabinets for its customers on Oct. 1, according to Earl Myers, sales manager. Purpose of this early start is to avoid a rush similar to that experienced last spring.

From the volume of orders for household cabinets being placed by its customers, Mr. Myers estimates that the Rex plant, with a capacity of 1,300 cabinets per day, will be at peak production through this fall, winter, and the early spring.

COMMERCIAL REFRIGERATION

Copeland Distributor Meets New Problems in Yale University Job

NEW HAVEN, Conn.—Electric refrigeration equipment, specially designed and installed to meet the rigorous requirements of Yale University officials, is being placed in Berkeley College, one of the housing units in the new Yale plan whereby all students are provided with room and board by the university.

Installation of the equipment is being made by The Westville Electric Co., New Haven distributor for Copeland Refrigeration Corp. C. F. Ganter, refrigeration engineer for The Westville Electric Co., is supervising the installation of the Copeland equipment.

Copeland systems are also being used in three other units of Yale University's housing system—the Yale Divinity School, Jonathan Edwards College, and Trumbull College.

The Berkeley College installation is probably most interesting of the four because it includes a number of special features—such as the application of forced-draft unit coolers in reach-in refrigerators as well as in walk-in coolers.

Copeland commercial condensing units installed include the following:

One 1½-hp. water-cooled unit which handles walk-in coolers for vegetables, meats, dairy products, and garbage.

One 1-hp. water-cooled unit furnish-

ing refrigeration for two reach-in refrigerators.

One ½-hp. water-cooled condensing unit operating in conjunction with a circulating drinking water system.

The walk-in coolers are especially designed and are lined with 1½ in. of tile on all sides and insulated with 4 in. of corkboard.

Forced draft cooling units are plated kitty-corner on a side opposite the cooler door.

Temperature is individually controlled in each box by a thermostat which operates a solenoid valve on the liquid line. Operation of the condensing unit is regulated by a pressure control.

Temperature range in the walk-in coolers is from 36° F. (in the garbage box) to 50° F. (in the vegetable box), the pressure control on the condensing unit being set to take care of the cooler using lowest temperatures.

The walk-in coolers measure 5x7x8 ft. 3 in. each.

Reach-in Cabinets

In the reach-in cabinets the forced-draft cooling units are placed in one end of the coil space in the top of the cabinet. The air flow from the units is horizontal with the shelves. Temperature control is by the same method as is employed in the walk-in coolers.

The garbage refrigerator is used to keep the garbage from fermenting until it can be picked up for final disposal. If it fermented, the odor would permeate throughout the kitchen.

The water-cooling system consists of a large tank in which the water is cooled directly by a copper coil. The tank is insulated with cork and the "head" is so constructed that when it is removed the coils come out with it, making for easy cleaning.

After being cooled the water is circulated to various bubblers by means of a two-pipe circulating system and a Westco circulating pump.

Tubing Put in Conduit

Refrigerant tubing in this installation is placed in conduit throughout the entire installation. In the machinery room where the compressor is installed there are shut-off valves on both the liquid and suction lines for each compressor.

There is also a pair of shut-off valves in a special box at each cabinet or walk-in cooler that is refrigerated.

Compressor legs are set on cork recessed into a concrete block, to eliminate all vibration and noise.

Other Copeland equipment installed by the Westville Electric Co. in the new Yale housing units includes:

Yale Divinity School—one 1-hp. unit refrigerating four walk-in coolers, one ½-hp. unit serving two reach-in refrigerators, one ½-hp. unit operating with the water-cooling system, and one ¼-hp. unit for an ice cream cabinet.

Jonathan Edwards College—one 1-hp. unit refrigerating three walk-in coolers, one 1-hp. unit serving two reach-in refrigerators, one ½-hp. unit cooling the garbage refrigerator, one ½-hp. unit operating with the water-cooling system, and one ¼-hp. unit on an ice cream cabinet.

Trumbull College—one 1-hp. unit for four walk-in boxes, one ¾-hp. unit cooling two reach-in refrigerators, and one ½-hp. unit for the drinking water system.

Seeger Equips Famed Broadway Tavern



La Hiff's Tavern in New York City, famed as a gathering place for satellites of the Broadway theatrical and sporting circles, was recently completely equipped with Seeger commercial refrigerators. Fish and meat boxes are cooled by special refrigerating systems.

Electric Units Reduce Milk Cooling Cost, Experiments Show

Brunner Cools Unit For Testing Device

DETROIT—That actual savings of three-fourths to five-sixths in milk cooling costs may be secured by the use of modern electrically refrigerated equipment instead of ice-operated apparatus has been proved by tests recently concluded in the East and in Kelvinator Corp.'s Detroit engineering laboratories.

Experiments conducted by research workers at the University of Vermont, and by the Boston Edison Co., operating under Kelvinator's Boston branch, established an average of 1 to 1.3 kwh. required for a 50° F. reduction in the temperature of 100 lbs. of milk under typical operating conditions. A standard electrically driven Kelvinator condensing unit was used in conjunction with an Esco milk-cooling cabinet.

In tests with Kelvinator's gasoline-driven condensing units—designed for use where electric power is not available—also employing Esco cabinets, engineers in the Kelvinator laboratories found that .18 gallons was the average amount of fuel necessary to accomplish the same work under conditions identical with those encountered in the Boston and Vermont experiments.

The University of Vermont research revealed that approximately 60 lbs. of ice are required to complete a similar milk-cooling operation. Experimenters in the Vermont Department of Agriculture at Montpelier found that the operating costs increased from 10 to 15 per cent when the Esco cabinet was replaced by a home-made insulated tank of cork and cement construction.

Considering a 3-cent kwh. rate, the electrically operated equipment consumed from 3 cents to 4.2 cents worth of power in reducing the temperature of the 100 lbs. of milk 50° F. Striking an average of 40 cents per hundred pounds as the value of ice, the cost of the ice necessary to complete the same cooling operation was 24 cents.

Super-Market in Texas Installs New Equipment

AMARILLO, Texas—H. A. Daniels, who entered the retail food business here in 1926 at the age of 55 and with \$600 capital and whose annual volume now is nearing the million dollar mark has installed Hussmann-Ligonier's new humidicooled display case equipment operated by a Frigidaire compressor.

The Nunn Electric Co., Frigidaire distributor, installed a 1-hp. Frigidaire water-cooled compressor which handles the two Hussmann-Ligonier ST412 display cases, one vegetable storage box and a water cooler with a capacity of 8 gal. per hour.

Controls on the display cases are set to maintain temperatures within the range of 34-36° F.

Mr. Daniels' progressiveness as a food merchandiser is demonstrated by the fact that he has remodeled his meat department and installed new fixtures four times in the nine years he has been in business, and by the fact that he advertises extensively, using the radio to draw trade from distances as great as 100 miles.

York Freon Compressor Placed in Food Store

McKEESEPORT, Pa.—York Ice Machinery Corp. has equipped the meat market operated here by James Savage with a 2-hp. Freon compressor and finned coils to handle the refrigeration requirements of the store.

Equipment refrigerated consists of two Gloekler display cases and one 10x8x10-ft. meat cooler. A temperature of 38° F. is maintained in the cooler, a temperature of 42° F. in 28 ft. of single-glass top display case, and a temperature of 41° F. in 10 ft. of double-glass top display case.

With an 80° F. room temperature, 75° F. condensing water temperature, and a 20° F. evaporator temperature, the machine produces an ice melting effect of 1,720 lbs. per hour.

Distributors Get Ready for "Big Business" in Commercial Refrigeration



Model Z. Water-cooled, 3 HP., 3,250 Lbs. I.M.E.

EVERY indication points to a mammoth national demand for correct commercial units. Conventional installations are being multiplied and new uses for electric refrigeration are being developed daily. This business will inevitably flow to the organizations which can fill every need.

Copeland is doing a wonderful job for the distributor. It provides a type and size for every class of installation, either high or low temperature. It supplies models which are correct in design, superbly manufactured, thoroughly tested before shipment and with a world-wide reputation for efficiency, economy and dependability.

LOOK OVER THE LINE

Eight air-cooled models, 100 lbs. to 1,073 lbs. I.M.E., 1/6 to 1½ HP. Seven water-cooled HP. Three "IC" models, 100-488 lbs. I.M.E., 1/6 to 1/3 HP. Three gas-engine driven models, 246-1,073 lbs. I.M.E., 1 to 2½ HP.

Full particulars, specifications, lists and discounts prove our point. There are handsome profits for the distributor in the "big business" of Commercial Refrigeration and Copeland offers a golden opportunity to those who would cash in on the national demand.

Copeland Refrigeration Corp., Mt. Clemens, Mich.
Division of Winslow-Baker-Meyering Corporation

Copeland

DEPENDABLE ELECTRIC REFRIGERATION

General Electric offers a COMPLETE LINE OF EQUIPMENT AND COMPLETE SALES TRAINING in Commercial Refrigeration



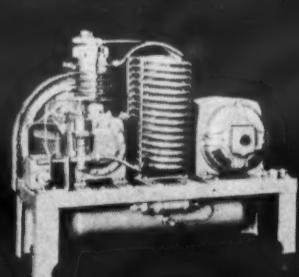
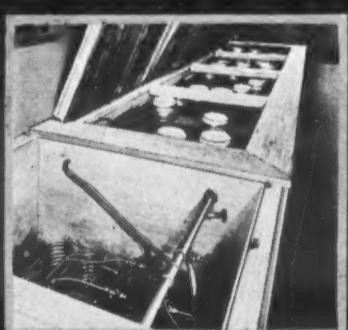
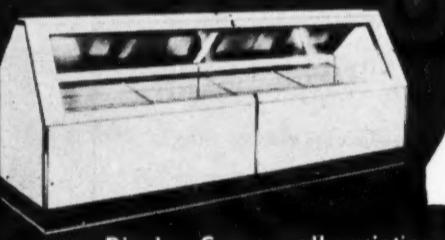
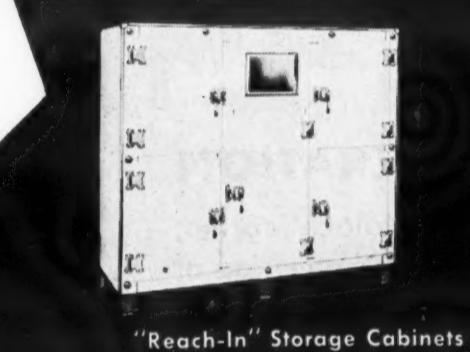
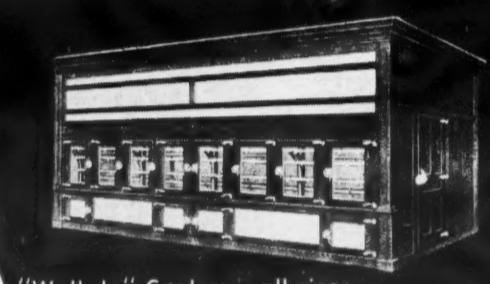
G-E Commercial Refrigeration Equipment Covers Every Conceivable Application

In the complete line of G-E Commercial Refrigeration is refrigerating equipment for every type and size of business, including food storage cabinets, "reach-ins," "walk-ins," display cases; bars and bar equipment; ice cream cabinets; soda fountains; ice makers; water coolers; milk coolers; etc. Prospects include meat markets, groceries, drug stores, restaurants, barbecues, hotels, taverns, hospitals, schools, institutions, offices, factories, dairies, dairy farmers, etc.

A VAST MARKET exists for the sale of modern commercial refrigeration. Prospects abound in every business block of your community, in your schools, hospitals, hotels and institutions. Unlimited profit opportunities exist for the electric refrigerator dealer who goes after this plus business. But *specialized knowledge* is required if you are to do a real job of selling commercial refrigeration.

General Electric gives you a complete and comprehensive sales training covering commercial electric refrigeration. Through personal contact with G-E commercial refrigeration specialists, supplemented by a series of instructive sound films and a complete commercial sales training, G-E dealers are schooled in the product, its uses, its markets, how to make surveys, how to calculate jobs and submit proposals on every conceivable application. In short, they *know* what they are selling, *who* are the buyers, and *how* to sell them.

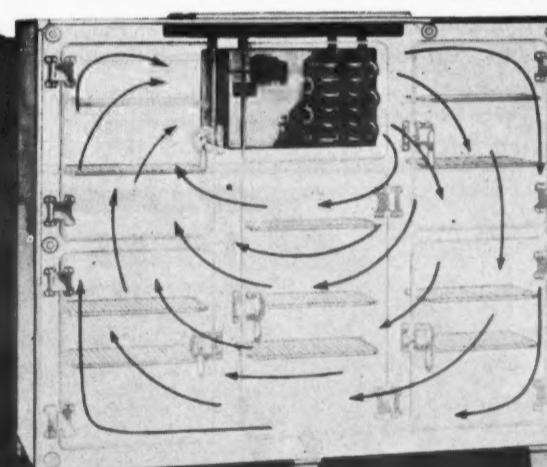
This training, coupled with a complete line of equipment bearing the greatest name in electricity, is what you need and *all you have to have* to go after the business intelligently, to get it quickly and to make more money. Write or wire for details of the General Electric franchise. Address General Electric Company, Electric Refrigeration Dept., Section DF82, Nela Park, Cleveland, Ohio.



Milk Cooling
Equipment
of every de-
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Complete line
of Water
Coolers

Bars and Beer Dispensing Equipment
for every requirement



THREE YEARS AGO General Electric originated this great improvement in food preservation with a current of conditioned air flowing around every pound of perishable food. Its three year record shows that it has saved merchants thousands of dollars in profits that were formerly losses. Food merchants can cut down expenses, step up their profit margins, make more money every day by equipping their stores with General Electric Conditioned-Air Refrigeration. Meats keep better and longer because a current of air, automatically controlled at exactly the right temperature and moisture content, circulates constantly through the entire cabinet.



conditioned air
GENERAL ELECTRIC
COMMERCIAL REFRIGERATION

COMMERCIAL REFRIGERATION

Must Balance Equipment & Load In Forced Convection Systems

By M. C. Terry, Manager, Commercial Applications Dept., Kelvinator Corp.

WITH forced convection units of proper capacity the close control of temperatures at any point above 35° F. ceases to be a problem, but the control of relative humidity is somewhat more difficult, with the result that it is the policy of some manufacturers to discourage the use of this type of cooling unit in installations where the control of relative humidity is of paramount importance. Inasmuch as the storage of meats and vegetables comes within the category of products requiring a very narrow range of relative humidity, such manufacturers are closing their largest commercial refrigeration field to this efficient type of cooling unit.

In field tests made to determine the best possible relative humidity conditions for the most commonly stored food products, vegetables, fresh meat (including freshly killed), and cured meats were chosen for experimentation. The major considerations were dehydration (shrinkage) and appearance, which includes the sliming of products due to too high relative humidity.

Dehydration not only causes a serious loss to the merchant due to shrinkage in weight, but is very detrimental to the flavor of the product because it removes the juices which contain most of the flavor. The dehydrated meat product is very unattractive in appearance: it is dark, at times almost black, and looks dry and brittle. Vegetables wilt, lose their crispness and have a wrinkled, faded

appearance.

Too high relative humidity, on the other hand, results in a deposit of moisture on the surface of meat products; it causes a sticky, slimy appearance and feel, making the sale of the article difficult if not impossible. If the relative humidity is excessively high, the shrinkage stops altogether, but the curing process also stops, which is very undesirable in fresh meats.

Another important angle on this condition is that the moist, slimy surface presents an ideal breeding place for bacteria, unless the meat is kept constantly under ideal temperature conditions. Meat taken from a refrigerator in this condition is more inclined to spoil rapidly if allowed to remain too long in warmer temperatures. Vegetables, on the contrary, seem to remain in good condition at any relative humidity above 90 per cent.

Fresh meats in a refrigerator at a temperature of 34 to 36° F. and at a relative humidity of 81 to 85 per cent are apparently maintained in an ideal

condition. Under these conditions the meat has a bright, healthy red color, is firm to the touch, feels neither moist nor dry, and the fat has a dry, fluffy appearance.

Cured meats, on the other hand, apparently require a lower relative humidity, between 72 and 78 per cent, unless the temperature differential in the refrigerator is kept within very close limits. This is due to the smooth, comparatively hard surfaces of most cured meats, which present an ideal place for the depositing of moisture if the temperature of the meat is permitted to rise above the "dew point" by even the slightest margin. This moisture deposit on cured meat is very conducive to the growth of molds, a frequent sight in refrigerators in which both fresh and cured meats are stored.

At usual meat storage temperatures—35 to 40° F.—these surfaces will not pass the "dew point" if the temperature differential is not greater than 3° F.

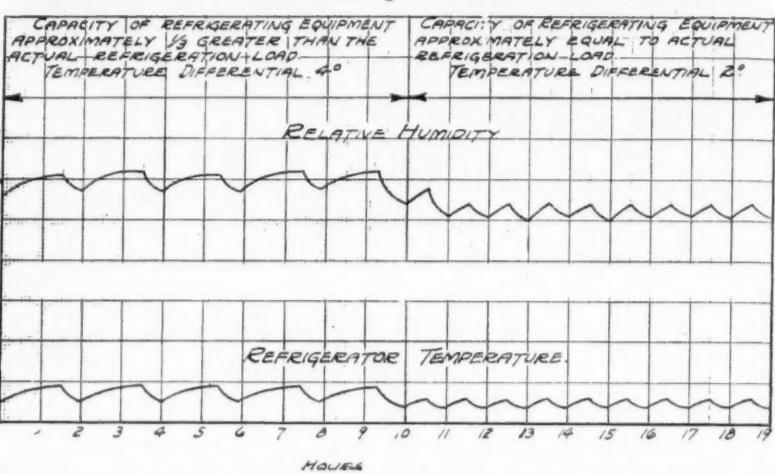
Factors Controlling Humidity

The chief factors in the control of relative humidity with forced convection cooling units are (1) the correct balancing of the cooling and condensing units and the refrigeration load; (2) a refrigerator temperature with a temperature differential not greater than 3° F.; (3) an average suction temperature near 22° F.; and (4) the proper placing of the thermostatic control bulb.

Possibly the most important of the above factors is the balancing of the capacities of the cooling and condensing units. If the cooling unit capacity is much greater than the condensing unit capacity the result is a higher suction temperature than necessary, with a consequent sweating of the surfaces of the cooling unit, because these surfaces are not sufficiently low in temperature to cause a formation of frost during the running cycle.

The force of the air driven over

Relative Humidity Control Chart



Left-hand side of the chart shows operating results when capacity of the refrigerating equipment is 1/3 greater than the load; right-hand side shows temperatures and humidity when load and equipment are balanced.

these surfaces does not permit the draining of a sufficient amount of the moisture, a large percentage being re-evaporated into the refrigerator. Tests indicate that the running cycle must be the drying-out cycle, and the accumulation of moisture in the slight frosting of the cooling unit is necessary to the correct control of humidity.

In the off cycle the accumulated moisture will melt into a large volume of water, the greater percentage of which will drain. After a few minutes of the off cycle, the cooling unit should reach a temperature comparable with the refrigerator temperature when there is no appreciable amount of moisture gathered by the cooling unit surfaces. Relative humidity invariably increases on the off cycle.

Unbalanced Condition

In instances where the condensing unit capacity is considerably greater than the cooling unit capacities—with a resulting short cycle, the cooling unit gathers a smaller amount of frost on each cycle. This unbalanced condition also results in a smaller volume of water at defrosting, with a larger percentage re-evaporated, and a more frequent re-evaporation because of more frequent defrosting cycles.

If the capacities of both the cooling units and the condensing unit are much greater than are required for the refrigeration load the result will be very short periods of operation and long rest periods. This condition is particularly conducive to high relative humidity because of the tendency of the relative humidity to rise during the off cycle. Equipment that is too small in capacity will, of course, cause almost continuous operation and will choke the cooling unit with frost or ice after a short time.

In an actual field test in which the equipment was of about one-third greater capacity than the actual refrigeration load requirement, the condensing unit was operating approximately 30 minutes in each two-hour period. This operation was continuous for that time, and the off cycle covered a period, therefore, of approximately one and one-half hours. The refrigerator temperature was 35 to 39° F. and the relative humidity varied between 86 and 92 per cent, following the temperature curve very closely.

Conclusions Correct

Changes were made, balancing the equipment with the load and the controls to maintain refrigerator temperatures of 34 to 36° F. The condensing unit operated 30 minutes in each hour, and, following the temperature curve very closely, the relative humidity ranged from 80 to 84 per cent, indicating that the conclusions drawn were correct. (Figure 1 graphically illustrates the conditions described.)

A close differential in the minimum and maximum temperatures allowed in the refrigerator is very essential with the use of forced convection units. While the average temperature of meats stored in the refrigerator will not attain the minimum maintained, the surfaces of the meats—particularly the hard-surfaced varieties—will be very close to the minimum.

With a 2° wet bulb depression in a 35° F. minimum refrigerator temperature, the relative humidity is between 81 and 82 per cent, which is ideal for fresh meat storage, but the "dew point" is reached when the temperature is allowed to warm up to 40° F. and a deposit of moisture becomes evident.

Suction Temperature of 22°

While this is also true of other types of cooling units, this condition is not nearly so noticeable because the circulation of the moisture-laden air is not comparable. A close differential also results in more frequent running cycles, which is desirable when attempting to correct a high relative humidity.

Well balanced equipment should operate at an average suction temperature of about 22° F. while maintaining an average refrigerator tempera-

ture of 35° F. A greater spread of this differential carries too much danger of complete stoppage of circulation through excessive frosting, while a closer differential will not allow any frosting on the operating cycle because the cooling unit surfaces have been raised to a temperature that will not frost the moisture deposited on them, and a corresponding high humidity is the result.

In equipment operating from a thermostatic control, the only manner of controlling the suction temperature is by carefully balancing the cooling units with the condensing units, and both of them with the refrigeration load.

There has been much discussion of the proper location of the cooling unit in the refrigerator. It is not believed, however, that a definite rule can be laid down to be followed in this connection. Apparently the physical construction of the refrigerator exercises considerable control over this location.

Adequate Circulation

It should be sufficient to be certain that the location will provide adequate circulation in all parts of the refrigerator and will eliminate the possibility of pickets or eddying currents of air. Whether the unit faces the door, away from the door, or at right angles in the refrigerator does not seem to be of prime importance.

It is necessary to prevent the air stream from blowing directly on products stored in the refrigerator, either by the use of louvers or through suitably placing the unit.

Another matter that has been the subject of considerable discussion is the placing of the control bulb of the thermostatic temperature control. In tests that have been conducted, this bulb was located in various parts of the refrigerator, and finally was placed directly in the air stream about 4 ft. from, and in front of, the cooling unit. Much better results and closer control were obtained in this position than in any other.

The conclusions drawn were that the forced convection units can be used, and with a high degree of success, if sufficient care is taken to balance the equipment and the load, if a proper temperature differential is secured in the refrigerator, if operation is maintained at the proper suction temperature, and if the control bulb is placed in the air stream from the cooling unit.

Forced Convection Units Used in Display Case

BRYN MAWR, Pa.—Ridgway Refrigerator Co. is equipping the new food market opened here by Hubbard Stores, Inc., with commercial refrigeration equipment embodying the Ridgway air-conditioning principle.

Included in the installation are 20 ft. of refrigerated display case, two butter boxes, two 8x10-ft. walk-in storage coolers, and a 10-ft. fish display case.

The Ridgway system includes the use of forced-draft circulation with distribution of the air through flues built adjacent to the refrigerator walls.

Coil chamber is located in the bottom of the case. Slow circulation of the air is located by a small Sirocco type fan. Air flues in the end of the refrigerator regulate the distribution of the air.

Ice Cream Refrigerator Cooled by Kold-Hold

LAKEWOOD, Ohio—Kold-Hold chilling units have been installed in the storage cooler of the J. W. Baker Ice Cream Co., local ice cream retailer.

The Kold-Hold units are installed in a cooler which has a shelf capacity of 400 gal. of bulk cream and a 30-in. aisle, which allows for the storage of a considerable amount of package cream.

A 1½-hp. Frigidaire condensing unit supplies the necessary refrigeration capacity for this installation.

Motor Satisfaction

AIR CONDITIONING • REFRIGERATION

This is the record of Century Motors in the Crystal Palace Market, San Francisco—typical of Century performance in thousands of installations in all types of severe service in all parts of the world:

Since 1922—12 YEARS' Continuous Service, No shut-downs, No repairs
...25 Horse Power Century 3-Phase Sleeve-bearing Motor, driving an 8-ton enclosed type Refrigerating Machine.

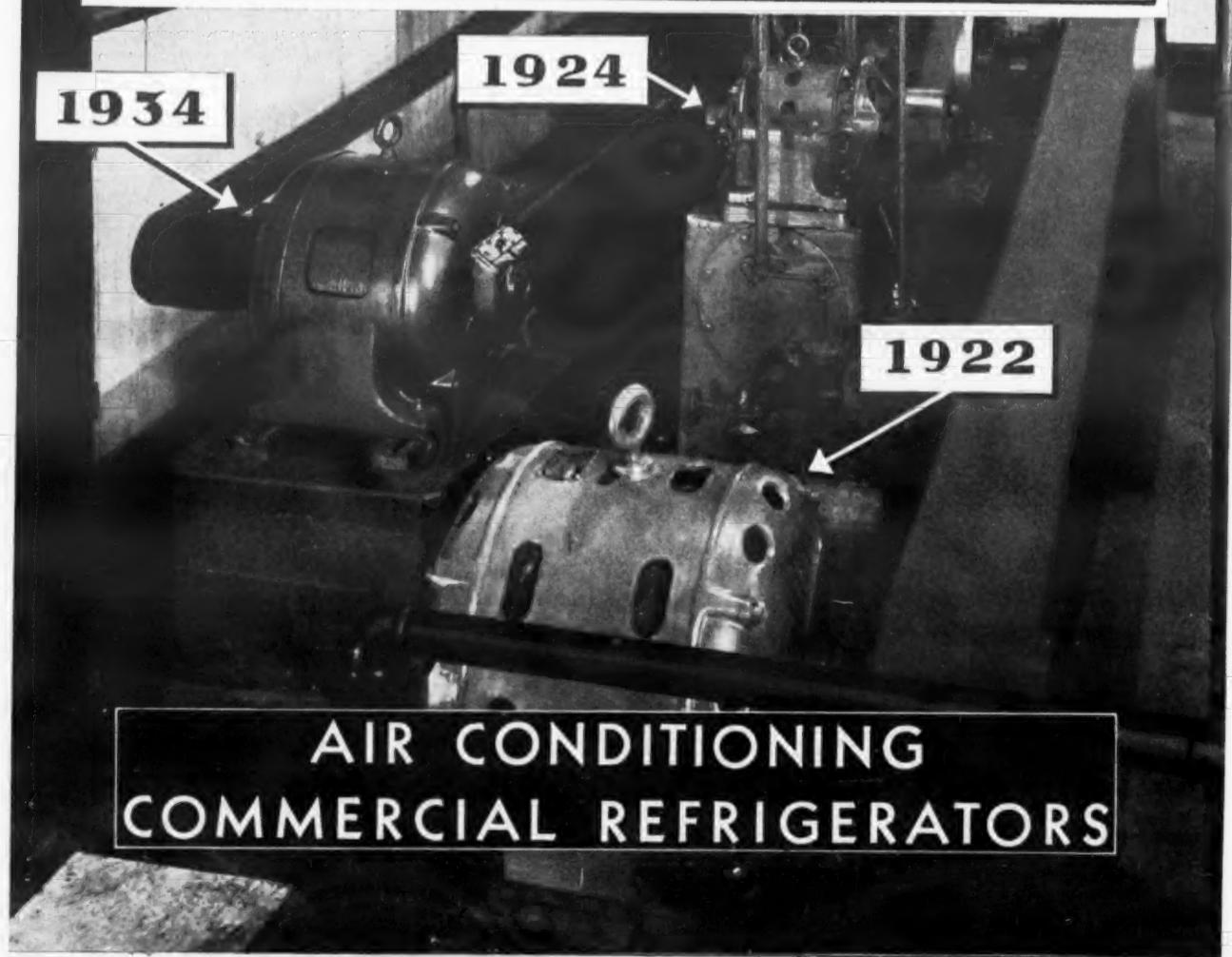
Since 1924—10 YEARS' Continuous Service, No shut-downs, No repairs
...3 Horse Power, Century 3-Phase Sleeve-bearing Motor, driving a 3-ton enclosed type Refrigerating Machine.

1934—ANOTHER CENTURY... 25 H.P. Century 3-Phase Sleeve-bearing Motor, driving an 8-ton Refrigerating Machine.

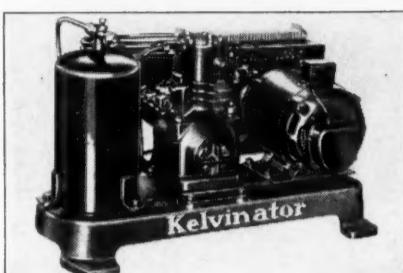
This is the kind of service that Manufacturers and Users get from Century Motors—Single Phase, Polyphase, Direct Current... Up to 600 H.P.... Consult Century Engineers.

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**109 DIFFERENT
COMPRESSORS**

The Kelvinator Line includes 109 different compressors ranging in sizes from $\frac{1}{4}$ h. p. to 20 h. p. Also gasoline driven units for installations off the power lines.



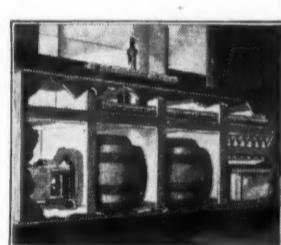
**WATER
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Water Coolers of the Bottle and Pressure Types in a wide range of sizes and equipment for every water cooling need.



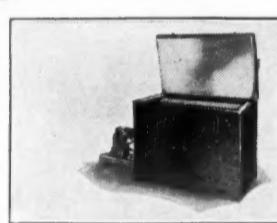
**BEVERAGE
COOLERS**

The new Duplex Beverage Cooler which maintains two distinct temperatures in the one cabinet. Also several other types of beverage coolers.



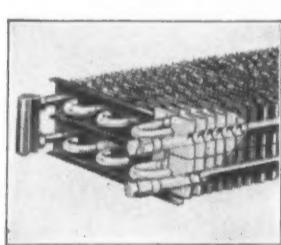
**BEER
COOLERS**

Beer cooling equipment for every type and size has fixture and storage refrigeration.



**MILK
COOLERS**

Milk cooling equipment that can be installed in old coolers or in new equipment.



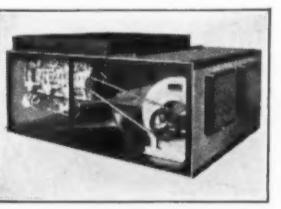
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Kelvinator Continuous Fin Coils are recognized as the finest ever developed. They are available in sizes and capacities for every requirement.



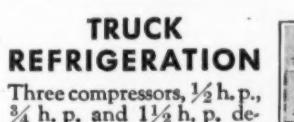
**SUBMERSION
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Submersion units, vertical units, deep fin type, bare pipe units, and multiple cooling units of all sizes and types.



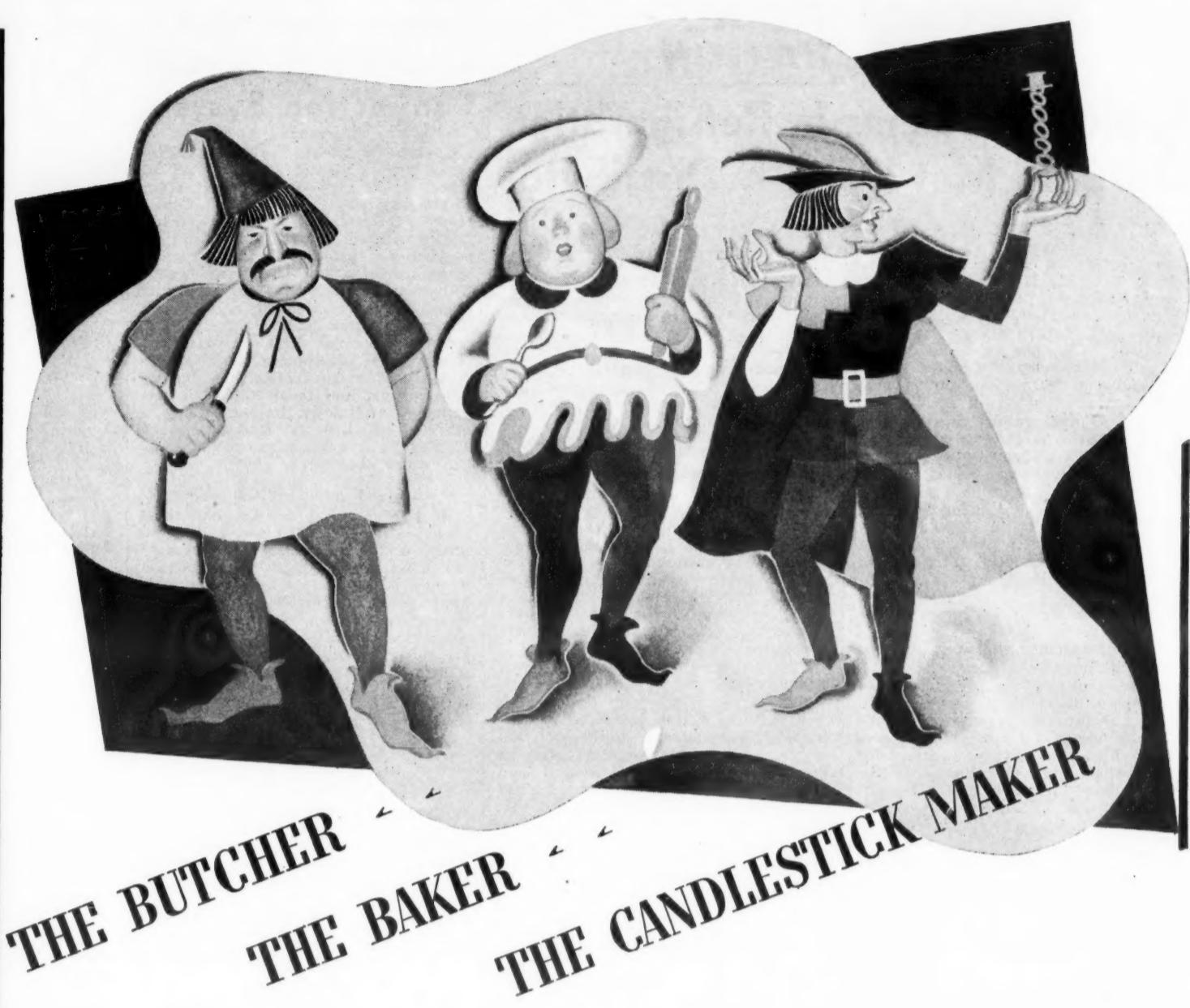
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Self contained Models, Floor Cabinets, Suspended Type Models, and complete equipment for every air conditioning need.



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Three compressors, $\frac{1}{2}$ h. p., $\frac{3}{4}$ h. p. and $1\frac{1}{2}$ h. p. developed especially for truck refrigeration and already in use in hundreds of installations.



the florist—the grocer—the druggist—the dairy farmer—the bacteriologist—the apartment house owner—the restaurateur—the photo engraver—the doctor—the beverage dispenser—and every retailer and manufacturer who uses electric refrigeration

**Every prospect for Electric Refrigeration is a
KELVINATOR PROSPECT**

THE dealers who are going to make the most money out of electric refrigeration are those dealers who appreciate the tremendous profit-possibilities of commercial refrigeration—and aggressively work this rich market.

For years, Kelvinator has recognized the almost unlimited possibilities of commercial refrigeration. Consequently, every field in which electric refrigeration is and can be used, has been the subject of intensive study and research to develop the finest equipment for each market.

To-day, the Kelvinator Line of condensing units, cooling units, air conditioning equipment, water coolers, milk coolers, beer coolers, ice makers, beverage cabinets, ice cream cabinets, and equipment for every electric refrigeration need is the most complete in the industry. It is a fact that every prospect for electric refrigeration is a Kelvinator prospect.

With such a complete Line, Kelvinator dealers do not have to compromise on any job with equipment that is too large or too small, or for any of many reasons, incapable of doing the work required by that particular installation. Kelvinator dealers are in a position to supply exactly the equipment for any and every commercial installation—regardless of size or kind.

The completeness of the Kelvinator Line and the Kelvinator System of EXACT SELECTION afford the dealer the biggest profit potential to be found in the industry. . . . KELVINATOR CORPORATION, 14250 Plymouth Road, Detroit, Michigan. Factories also in London, Ontario, and London, England.



KELVINATOR

COMMERCIAL REFRIGERATION

Special Problems in Refrigeration On Ship Met by G-E Distributor

MILWAUKEE — Meeting several problems peculiar to the installation of refrigeration equipment on shipboard, the E. H. Schaefer Corp., General Electric distributor here, has completed an installation of "conditioned-air" refrigeration on the *Steamship Virginia*, a combination freight and passenger steamer which plies between Milwaukee and several lake ports.

The G-E distributor has equipped the boat with a 1½-hp. condensing unit and a "conditioned-air" evaporator for a walk-in cooler which measures 7x10x8 ft.

The condensing unit also furnishes refrigeration for tank-type coolers which are installed to furnish cold drinking water for the passengers and the crew.

According to E. V. Oakwood, commercial refrigeration manager for the E. H. Schaefer Corp., there were a number of special problems to be met in installing the equipment.

Since space is at a premium on a boat, the problem of the type of condensing medium to use confronted the G-E engineers. An arrangement was finally made whereby an air-cooled condensing unit could be used, this being done by changing partitions around the unit from wood to wire mesh, and supplying auxiliary air movement.

The electric current supply on the boat also presented a problem. The current on boats of this type is 110 volt d.c., the generator supplying this current being direct driven by a steam

engine. Steam elevators are used in loading and unloading freight on the *Virginia*, and it was found that when the elevators were in use, the steam supply was robbed to such an extent that there was considerable voltage drop.

In order to protect the motors on this installation, special step starters were used with an automatic low voltage cut-off in the line. By oversizing the motor, and by the use of the step starters, the motor starts under full load without even flickering the lights, Mr. Oakwood declares.

The installation maintains an average temperature of 38° F. in the walk-in cooler, and furnishes drinking water at 50° F. Refrigeration is accomplished throughout by direct expansion cooling units with low pressure control. Between the water cooler and the "conditioned-air" evaporator an automatic two-temperature regulating valve is installed with a temperature regulating valve on each water cooler.

The tank type water coolers are located under the main deck, just below the bubblers, with all cold water lines insulated. In order to meet all requirements, the walk-in cooler was re-insulated with 3 in. of additional corkboard over the old installation.

Capacity of the water-cooling system was estimated from the number of the crew, and the average number of passengers.

Freon was the refrigerant used in the installation.

Eastern Firm Equips Trucks with Forced Convection System

LANSING, Mich.—York Motor Express Co., operating a large fleet of trucks covering points east from Harrisburg, Pa., to the Atlantic Coast, recently equipped a 10-ton truck trailer with the new Kold-Hold forced convection system of refrigeration, with refrigeration furnished by a Universal Cooler 1½-hp. gasoline engine driven condensing unit housed under the truck body.

On the truck's first run with the refrigeration equipment May 19, in which its load consisted of butter, frozen eggs, and meat, the load was delivered at exactly the same temperature at which it was loaded, namely, 42° F. The trip was made from Jersey City to Philadelphia.

More Equipment Ordered

York Motor Express Co. has since placed orders with the Kold-Hold Mfg. Co. for additional equipment.

The Kold-Hold Mfg. Co. claims that its new forced-convection system may be adjusted to provide any desired temperature within the range of 35 to 60° F., and that such temperatures are automatically maintained by the thermostatically controlled blower. Air is delivered to all portions of the load in which refrigeration is required with a temperature variation of less than 5° F.

Mechanics of System

Mechanically, the system is described as consisting of an insulated housing containing three Kold-Hold cooling units, usually installed in the front end of the truck body, and connected to ceiling ducts through which the air in the body is circulated by means of a thermostatically controlled blower when refrigeration is desired.

The cryohydrate in the Kold-Hold units is frozen by means of an electrically or gasoline-driven compressor mounted on the truck, or by hook-up with the central plant refrigeration system or a compressor mounted in the garage.

By means of a heavily insulated curtain and suitable damper controls in the ducts, refrigeration can be confined to any portion of the load which makes it possible to haul mixed loads at a minimum of refrigerating expense.

Improvements in Farm Milk Cooling Shown At World's Fair

CHICAGO—The application of modern mechanical refrigeration in farm milk cooling is being shown daily to an average of 3,200 persons in the model farm house erected by the Crowell Publishing Co. at A Century of Progress.

In the milk room of the \$5,000 rural structure is a Frigidaire "flowing cold" cooler with a capacity of six milk cans.

Attendants in the house report that most of the visitors to the house have never seen the workings of a small dairy farm and express interest in the rapidity with which fresh milk only a few minutes from the cow can be dropped in temperature to below 50° F. and increase of bacteria arrested.

Flexibility Is Feature Of York Installation

RICHMOND, Va.—The two deluxe food stores here of the D. Fender Grocery Co. chain, which has food markets throughout Virginia and North Carolina, have recently been remodeled and equipped with modern refrigerators and refrigerating machines, the latter being York Freon units.

In the deluxe store located at 3008 Cary St., a 2-hp. York air-cooled Freon unit refrigerates a 6x8x10-ft. meat display case, a 7-ft. butter box, one 14-ft. top display case, and one 8-ft. top display case.

At the other store, located at 712 Sheppard St., another 2-hp. York Freon air-cooled condensing unit has been installed to operate with standard York coils of the square finned design. The York unit cools the same arrangement and type of display fixtures as in the other store.

This latter system maintains temperatures of 38° F. in the meat coolers, 42° F. in the display case, and 45° F. in the butter boxes.

Temperature control is by thermostatic expansion valves, which automatically regulate the flow of Freon to each set of coils. The entire system is controlled by a suction pressure-actuated switch located on the unit.

A feature of this system is its flexibility. Thus, if any one refrigerator needs refrigeration, it may be furnished without affecting the temperatures of the other fixtures operating from the condensing unit.

Refrigerated in a New Way



This truck trailer is cooled by a Kold-Hold forced convection cooling system, refrigeration furnished by a Universal Cooler unit under the body.

Eastern Apple Growers Construct Electrically Cooled Storage Houses

WAYNESBORO, Pa.—Installation of modern, mechanically refrigerated storage plants for a number of apple growers in the Appalachian apple growing territory has been made by Frick Co. in the past few years.

The Appalachian Orchards at Paw Paw, W. Va., last summer equipped the first floor of its storage house with a unit air cooler connected to a Frick 5x5 combined ammonia machine.

This storage house has no cork insulation on the walls, which are built of 12-in. terra cotta tile. Eight inches of ground cork is used on the ceiling and 18 in. of cinders under the concrete floor. Standard refrigerator doors are installed. Each floor holds 10,000 barrels and the cold storage space measures 72x84x14 ft.

The Niagara blower unit is arranged to handle the air content of the room once every nine minutes. The thermostat stops the compressor when the temperature reaches 32° F. and starts it again at 36° F., the intermittent action allows for defrosting of the coils.

Cost of current, including that required for the compressor and pump, lighting in packing room and storage, and power for the grader motor, ran as follows:

October, \$66.29; November, \$88.62; December, \$49.58 (these are the three months when the apples were held in storage).

Electric current rates at Paw Paw, for a commercial load of this size, are 5½ cents per kWh. for the first 1,190 kw. used during any one month, and 1¼ cents for the next block of 1,190 kw. and 1 cent thereafter. Nearly all of the current consumed was paid for at the 5½-cent rate.

According to L. P. Miller, owner of the Appalachian Orchards, 7,500 barrels of apples were placed in this storage at a temperature of 56° F., and after 2½ days of operation the refrigeration system had the temperature down to 33° F.

The storage house of R. S. Dillon, whose farm is on the National High-

way about two miles west of Hancock, Md., is cooled with a 6x6 compressor driven from a 25-hp. motor.

The building has nearly 88,000-cu. ft. capacity and is equipped with 4,200 ft. of 2-in. direct-expansion ammonia piping, a condenser 16 in. in diameter by 12 ft. long, a cooling tower, and automatic controls.

Mr. Dillon is subject to approximately the same rates for electric current as those shown for the Appalachian Orchards, but by running his compressor mostly at night he is able to enjoy an off-peak rate, which for commercial users of current is only about half the regular day rates.

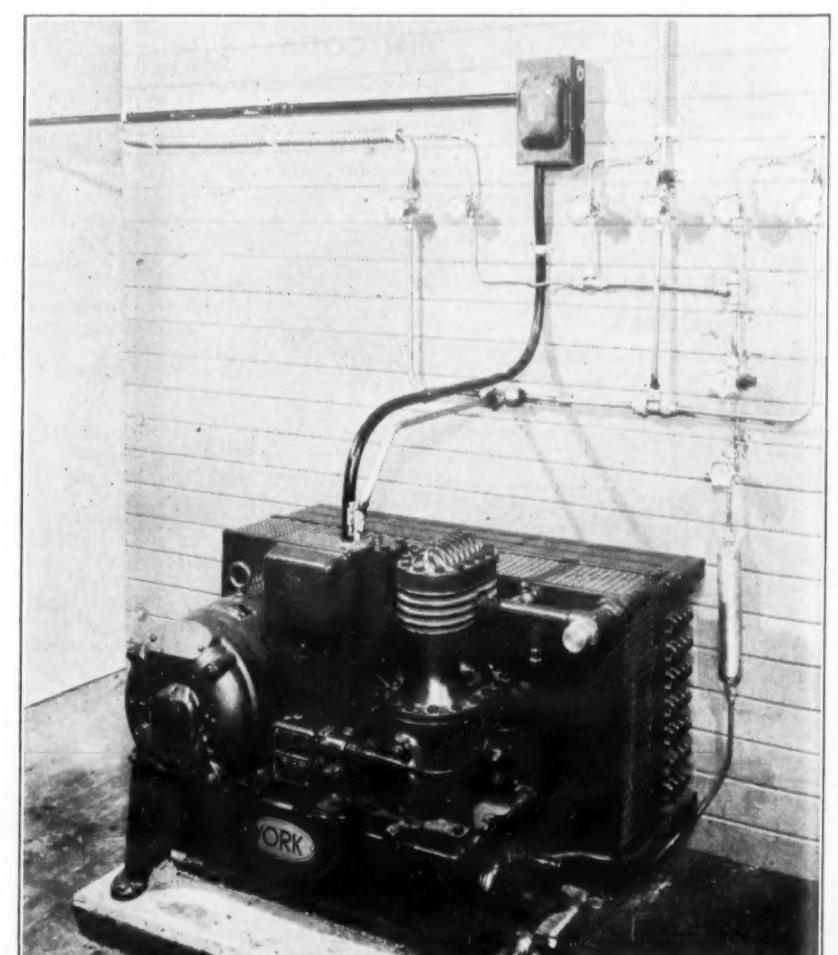
The Trexler Farms at Allentown, Pa., has a 4-room storage house holding 30,000 bushels of fruit. The plant is entirely automatic, and has three 6x6 compressors. Peaches, apples, and other fruits are kept in storage.

Regarding the performance of the storage, a letter from the management addressed to the Mack Machine Co. of Philadelphia, which made the installation, states:

"In checking up against our total operating costs, power, depreciation, taxes, interest on investment, and all charges, we find that it costs about 10.4 cents a bushel per season to store a total of 30,000 bushels of fruit including 15,000 bushels of peaches, which are stored for a period of two months and 15,000 bushels of apples for a season of about six months.

"As you know, our production is so large that we are also required to store fruit in cold storage houses, on which the rates are 28 cents per bushel for peaches for two months and 30 cents for apples for a season of approximately six months. If we were without the storage you installed, it would cost us \$4,200 to store our peaches, and \$4,500 to store our apples. Balancing this up against the cost of storage which is \$3,120 per season for 30,000 bushels, we find we have a saving of \$5,580, which means that the plant paid for itself in a little over two years."

Neat Food Store Installation



York Freon unit in a Richmond, Va., store. (See story in next column.)



... the motor that dominates the large single-phase motor field

There are several good reasons why Wagner's type RA repulsion-start-induction motor is so extensively used where integral-horsepower motors are needed on single-phase circuits.

1. It is self-contained—that is, it does not depend upon auxiliary devices to help it get started.

2. Its starting-torque is very high. At the same time, the starting-current is comparatively low.

3. The brushes lift when the motor approaches full-load speed. The RA starts as a repulsion motor, and when the speed reaches a predetermined value, an automatic mechanism short-circuits the rotor windings, converting the motor into an induction motor. The same mechanism also lifts the brushes, as they aren't needed after the rotor-windings are short-circuited. Thus interference with radio reception is minimized, and brush noise, brush and commutator wear and brush friction are limited to the brief starting period only.

Ever since Wagner put the first commercially successful single-phase motor on the market in 1896, this type of motor has dominated the large single-phase motor field. Wherever integral-horsepower single-phase motors are required, the Wagner RA is the logical choice. For complete description ask for Bulletin 173.

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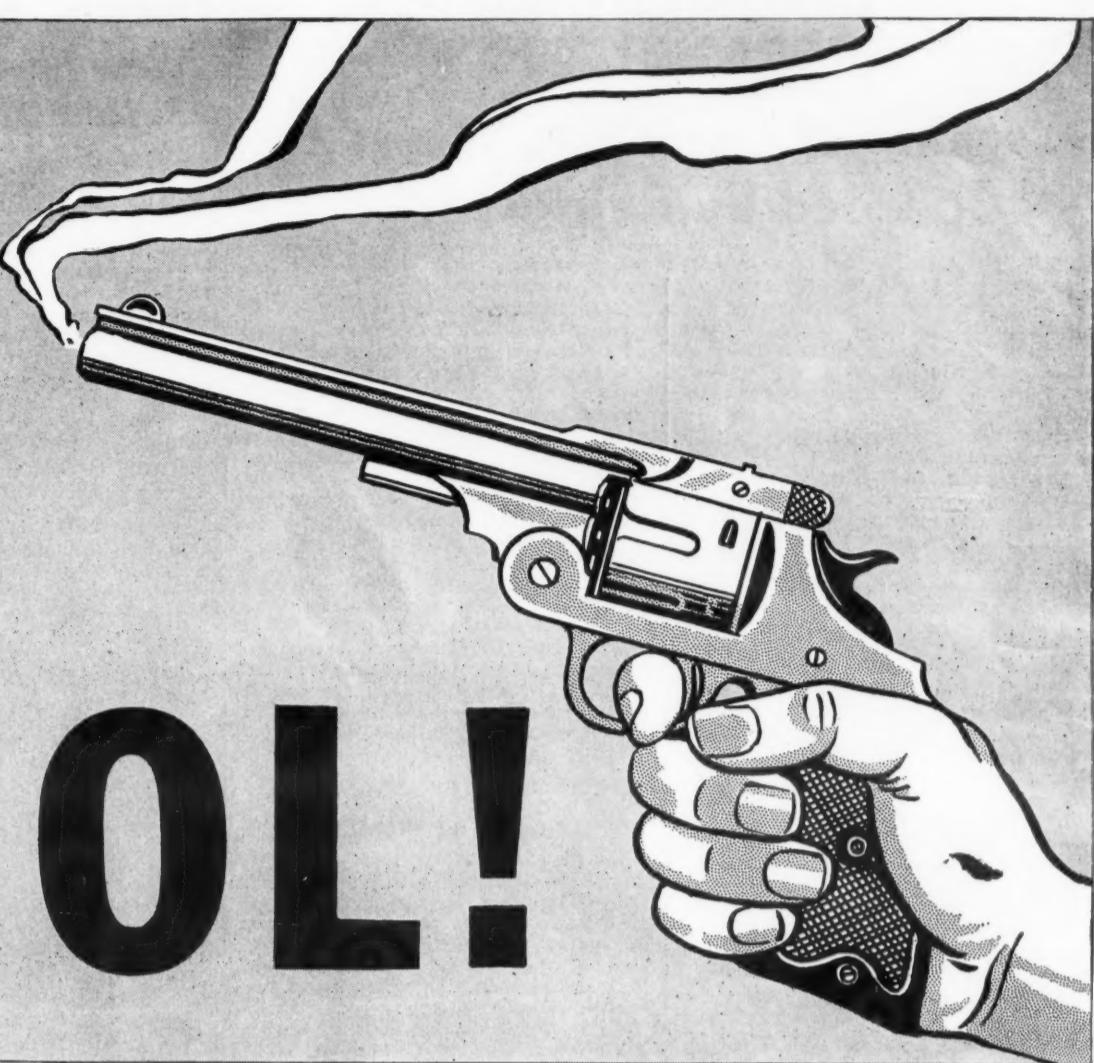
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Please send copy of Bulletin 173
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If also interested in fractional-horsepower motors, place "X" here.

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MODEL 1151—A superb 11-tube receiver with true all-wave, world reception. One of a complete line of outstanding all-wave table and console-type models with Signal Beacon, dual-drive tuning, automatic antenna adjuster, airplane-type dial, continuous full-range tone control, r. f. amplification on all stages, automatic volume control, and many other features. Other models include skip-band (long and short wave), dual-wave (550-4,000 kc.), AC-DC, and true remote control radios to meet every dealer need.

LOOK INSIDE
before you choose your
radio line. The size, qual-
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Grunow part tell their
own story

Grunow

ALL-WAVE RADIO

PRODUCT OF GENERAL HOUSEHOLD UTILITIES COMPANY

Dealers call new Grunow "The hottest set we ever heard!" as world stations click in! Signal Beacon and other marvels revolutionize all-wave radio—make every home a prospect!

**"DYNAMITE" MERCHANDISING PLAN
already under way. Read—and act—today**

WHEN an old-time radio dealer's eyes pop open and he says "Please! I want your line"—a radio must be GOOD! But that's just what they're saying about the marvelous new Grunow.

It's the hottest thing that's ever hit the market. You actually use Europe to demonstrate in your store. The tone is true Grunow Living Tone. The cabinets are the hit of the year. And the selectivity, quietness, power and ease of operation are absolutely amazing.

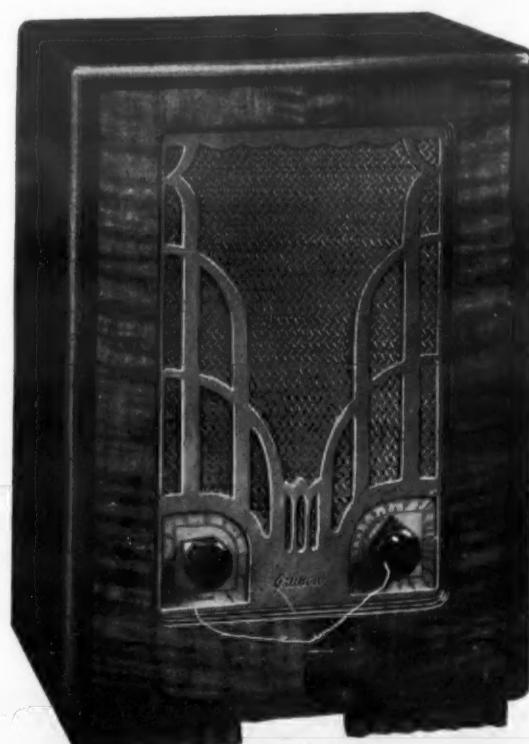
The reason is that Grunow has more than just another all-wave radio. There's the revolutionary Signal Beacon that actually finds elusive foreign stations for you!—the brand new automatic control that "peaks" antenna efficiency on each wave-length!—the "split-hair" dual-drive tuner—the r. f. stage operating on all wave bands

—and a dozen other basic improvements.

Get your hands on the dial of one of these amazing Grunows now. Tune and hear it. See the whole line, with models to meet every preference. Then get the startling news on prices—and go places with Grunow.

Ask about the sensational Grunow merchandising plan now starting. It's the stand-out idea in the whole history of radio!

GENERAL HOUSEHOLD UTILITIES COMPANY
2650 North Crawford Avenue, Chicago, Illinois



COMMERCIAL REFRIGERATION

Ageing of California Wines Is Speeded by Refrigeration

TULARE, Calif.—The Tulare Winery is one of the first in the San Joaquin Valley to answer the question of speeding the ageing of wines by the installation of mechanical refrigeration and wine cooling equipment, furnished by the York Ice Machinery Corp.

Equipment recently installed at this winery provides for the cooling of approximately 650 gals. of wine per hour from 50° F., which is the temperature at which it comes from the storage vats, to 28° F., at which temperature the wine makers of this region have definitely agreed the best results are obtained in wine cooling.

Equipment furnished consisted of one 6½x6½ in. York compressor, running at 310 r.p.m. and driven by a 30-hp. motor; one 24x10 in. horizontal receiver; one 16 in. x 20 ft. shell-and-tube type condenser; one 16 in. x 16 ft. shell-and-tube brine cooler unit; one brine pump of 125 gal. capacity; and one 1½ in. x 2½ in. x 12 ft. wine cooler of the internal tube design, 10 pipes high. This latter unit was insulated and lagged, the inner tube of the barrel being constructed of stainless steel.

In order to obtain maximum efficiency in the transfer of heat from both the wine cooler and the brine cooler, the brine pump installed had a capacity to deliver more brine than could be circulated through the double-pipe wine cooler. Thus a high velocity was maintained through the shell-and-tube brine cooler.

A by-pass connection was provided so that full discharge from the pump was delivered through the brine cooler and only a proportionate part of the brine allowed to pass through the wine cooler. A thermostat placed in the brine line made the operation of this equipment automatic.

A low pressure, automatic float regulator was fitted to the brine cooler with a highly sensitive solenoid valve in the liquid line. A suction-pressure regulator was also installed in the suction line to prevent the suction pressure from dropping too low with low loads, thus providing maximum flexibility of the equipment.

under varying loads, and preventing the possibility of a brine freeze-up.

Transfer of wine from one vat to another was handled by hose connections between the vats, the wine being circulated by a rotary pump.

A dual recording thermometer installed on the line, with connections to and from the cooler, provided means for recording the temperatures at both ends of the line, and of keeping these temperatures at constant levels. To obtain constant temperatures was a necessary requirement of the equipment, important to the cooling operations, and as the alcoholic content in various wines varies from 14 per cent in wine, to 21 per cent in sweet wine, the flow of wine through the cooler is regulated by means of a throttle valve in the discharge line of the pump, as a further means of maintaining constant temperatures.

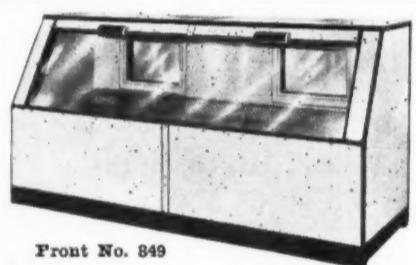
Beer Cooler Installed For Dealer Meeting

DETROIT—Ease with which modern commercial electric refrigeration systems and beer-cooling units can be set up and operated was demonstrated at a recent convention held here by Morley Bros., distributor for Stewart-Warner Corp.

To cool beer which was served in conjunction with a continuous buffet luncheon, Morley Bros. officials enlisted the help of Temptrite Products Corp. and Universal Cooler Corp. Temptrite supplied the beer-cooling unit and Universal Cooler a 1½-hp. air-cooled condensing unit.

Compressor, beer-cooling unit, and keg were set up in a room on the top floor of the Statler hotel in less than half a day, the control was set to allow for maximum capacity, and beer was served continuously for three days.

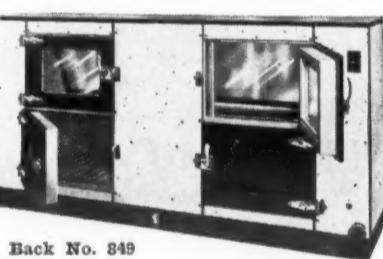
During one night session of the meeting, H. B. McLaughlin, Temptrite Products chief engineer, acted as bartender, explaining the advantages of mechanically refrigerated beer coolers and the Temptrite foam control method.



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Top Display & Bottom Storage
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Glass Front and Doors—Set in non-
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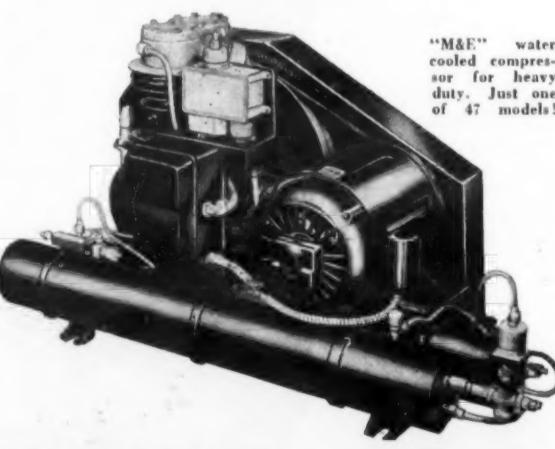
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When maximum efficiency is demanded,—when the job is tough and nothing but the best will do,—"M&E" will fill the order exactly. "M&E" is not only a versatile line, meeting every standard and requirement, but is also winning National acclaim for quality, economy, and proven dependability.

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Problem of Banana Ripening Solved by Forced Draft Units

DENVER—Grand Junction Fruit Growers Association has solved the problem of proper storage of bananas with the installation of forced convection cooling units.

The installation was made by Colorado Public Service Co., Kelvinator distributor.

The matter of correct temperatures in banana storage is all important. Bananas are shipped green and must be kept between 56° F. and 65° F. to prevent premature ripening. If chilled below 55° F. the fruit will decay when warmed to ripening temperature without ever becoming ripe enough for consumption.

Another difficulty in storing bananas is due to the immense amount of heat generated by the fruit as it ripens. The ripening process which consists of converting starches into sugar, actually generates 8.64 B.t.u.s per day per lb. Thus 10,000 lbs. of bananas adds 84,400 B.t.u.s to the total heat load.

The banana storage and ripening room of the Grand Junction Fruit Growers Association measures 10x30x7½ ft. Kelvinator equipment installed consists of a WRB-440 condensing unit and two forced convection cooling units.

Advantages of Modern Cooler Told by Dispenser

MILWAUKEE—The tavern operated here by Frank Brunner has been equipped by the Sieg-Milwaukee Co., Frigidaire distributor, with a pre-cooler, bar-cooling unit, and ice maker.

Reviewing the effects of the modernization upon his business fortune, Mr. Brunner states:

"On April 7, 1933, I changed my restaurant over to a tavern with the advent of real beer, but I put up with ice until last November when I was sold on the idea of really doing a good job of refrigerating my beer and bought a six-tap cooler and a pre-cooler for storage in the basement.

"My equipment consists of a Frigidaire cooler with one tap for dark beer, two taps for light beer, one tap for ale, one tap for charged water, and one tap for drinking water. The pre-cooler is 8x10 ft. and has a storage capacity of 25 half barrels.

"Beer is drawn at a temperature of 41° F. and served at a temperature of 42 or 43° F. We can draw steadily day or night and still the temperature remains constant.

"My ice expenditures averaged \$24 a month. My cost for refrigeration now has been \$5.10 a month average, including some exceptionally hot months.

"In addition, I have an ice maker that supplies me with 144 cubes every three and a half hours. This ice is used for mixed drinks and for cooling wines."

Frigidaire Forced Draft Units Cool Vegetables

CHICAGO—Application of mechanically refrigerated forced draft cooling units to a large vegetable and fruit storage room in the heart of the South Water Market section of Chicago has been made by Kramer Bros., wholesale fruit and vegetable house, with the installation of Frigidaire "flowing cold" commercial evaporators.

Nine "flowing cold" coils and a 10-ton Frigidaire compressor were installed to replace the frequent filling of bunkers with from 10 to 15 tons of ice. The installation was sold and engineered by the commercial division of Frigidaire Corp., Chicago branch.

M. Kramer, head of the house, said: "The system replaced the use of ice, of which we frequently had to handle from 10 to 15 tons at a time, carting it through our warehouse and stowing it away in bunkers.

"The cold air is circulated throughout the room by means of the blowers, reaching into piles of crates and even into the crates themselves, guarding against spoilage of oranges, grapefruit, lemons, prunes, and the many kinds of vegetables."

G-E Coolers Installed in Rochester, N.Y. Bar

ROCHESTER, N. Y.—The new "Peacock Cocktail Room" of Odenbach's Coffee shop here has been equipped with an artistically decorated and lighted Russ bar which operates in conjunction with General Electric refrigeration equipment.

The installation was made by the Gould-Farmer Co., Inc., G-E distributor in central New York state.

The bar is a five-tap bar, and is so equipped that two bar tenders can work the bar at one time. Special wine cooling storage space in back of the bar is also refrigerated with General Electric equipment.

Unit Coolers Should Be Installed So Outside Air Is Not Drawn In

By Joe Askin, Chief Engineer, Fedders Mfg. Co.

ADVANTAGES of forced draft unit coolers may be enumerated as follows: (a) small space occupied; (b) simplicity of installation; (c) better air circulation; (d) increase in available space in refrigerator for handling meats or for other purposes, due to the removal of the baffles; and (e) maintenance of a better relative humidity. Fig. 1 shows Fedders recommended methods for installing forced draft unit coolers in various types and sizes of refrigerators.

some extent by using a heat interchanger coil, an equalizer tank, or an economizer switch to shut off the fan during a certain portion of the cycle.

A simpler, more reliable, and less expensive method of eliminating short cycling is to change the pressure control setting by widening the differential between the cut-in and cut-out points. Instead of having a setting of zero to 10 lbs. (SO₂ refrigerant), the setting may be changed to as much as a 4-in. vacuum cut-out, and 12 lbs. cut-in.

Keep in mind that as the cut-out pressure is lowered, the cut-in pressure should be raised accordingly. Otherwise, frost will accumulate on the fins of the unit and the unit will become "frostbound." In case 4 in. and 12 lbs. does not give a good cycle, change the setting to 8-in. cut-out pressure and 14 lbs. cut-in pressure. Almost any length of cycle desired, within reason can be obtained in this way.

Do not recommend forced draft unit coolers in case the customer wants temperatures less than 38° F. average (36 to 40° F.). In case the customer wants to maintain 34° F., there is a chance for a freeze-up of the forced draft unit cooler. Therefore, recommend for an installation of this sort the standard type of finned tube commercial cooling unit.

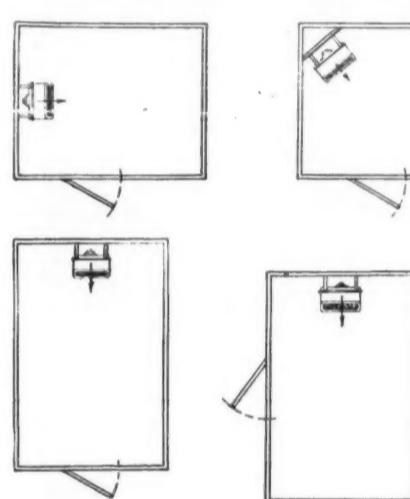


Fig. 1. Recommended methods of installing Fedders forced draft coolers.

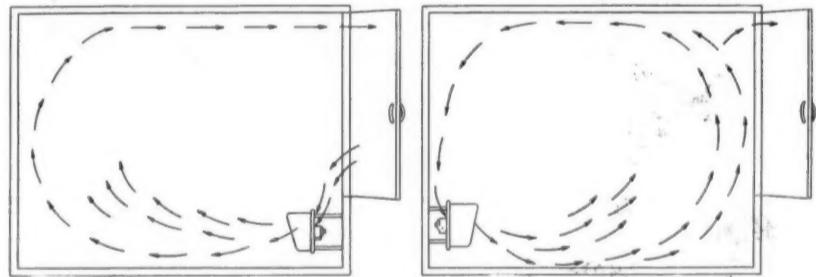


Fig. 2. Mr. Askin suggests losing some air outward (left), rather than drawing in warm outside air (as at right).

Specifications of Fedders Forced Draft Units

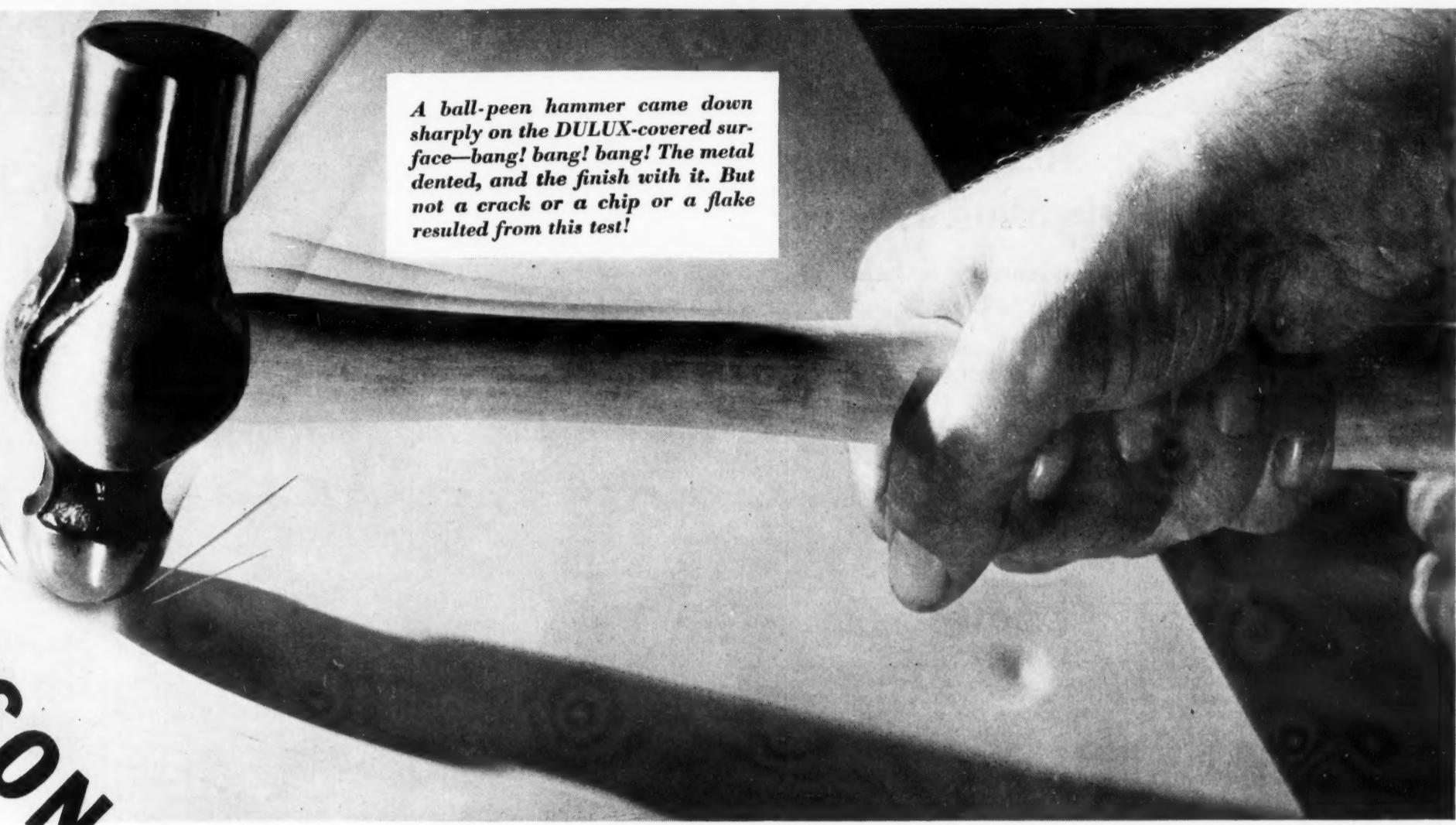
Model No.	208	210	212	214	216	316	318	518
Square feet of surface	21	30	47	63	83	125	215	359
Motor horsepower	1/250	1/125	1/30	1/30	1/20	1/20	1/15	1/6
Watts	30	40	65	75	90	90	116	250
R.p.m. of fan	1650	1500	1150	1150	850	850	860	1150
Fan diameter (in.)	8	10	12	14	16	16	18	18
Fan pitch (in.)	3/4	3/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Air volume (cu. ft. per min.)	360	388	786	1146	1228	1190	1852	2500
Net weight (lbs.)	28	30	44	49	77	86	162	209
Inlet connection S.A.E. flare	1/4	1/4	1/4	1/4	1/4	1/4	5/8	5/8
Outlet connection S.A.E. flare	1/2	1/2	1/2	1/2	1/2	1/2	5/8	5/8

Model No.	208	210	212	214	216	316	318	518
I.M.E. in lbs. per 24 hours at 38° F. box temperature and at 24° F. refrigerant temperature or 14° F. temperature difference	205	350	583	758	933	1167	2051	3036
B.t.u. per hour at 38° F. box and 24° F. refrigerant temperature or 14° F. temperature difference	1230	2100	3500	4550	5600	7000	12310	18220

*Sensible heat only.

APPROXIMATE SETTINGS OF PRESSURE CONTROLS

For Sulphur Dioxide:	0 lbs.
Cut-out pressure	.10 lbs.
Cut-in pressure	
For Methyl Chloride:	
Cut-out pressure	.12 lbs.
Cut-in pressure	.27 lbs.
For Freon (F-12):	
Cut-out pressure	.18 lbs.
Cut-in pressure	.36 lbs.
Above settings are based on unit cooler being located reasonably close to the condensing unit. For long suction line, set cut-out back pressure lower than the above readings, allowing for friction loss in line. Cut-in back pressure may then have to be raised slightly to offset any reduction in back pressure.	



ONE REASON WHY more than

800,000

Household Mechanical Refrigerators

HAVE BEEN FINISHED WITH **DULUX**

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EIGHTEEN MONTHS AGO not one single refrigerator was finished with DULUX . . . yet already, in a short year and a half, more than 800,000 of them have been finished this superior, modern way!

That certainly is a convincing story to be able to tell your housewife prospects, you salesmen of DULUX-finished refrigerators! And here are some other convincing facts, too.

Before du Pont was satisfied with its new refrigerator finish, DULUX had to undergo a great many more severe tests than a refrigerator would normally meet in actual service.

Take the Hammer Test, for instance. Imagine deliberately hitting the surface of a refrigerator a number of hard, swift

blows with a hammer! Yet the DULUX finish did not chip or crack or flake.

Or take the Grease Test conducted in Florida, where atmospheric conditions are unusually severe. An actual DULUX-finished refrigerator door was wiped with grease from top to bottom and various sections of it treated in different ways. Three sections were left under grease for 13 months! Yet when the door was cleaned at the end of that time, not a sign of rusting, cracking, or peeling! Just compare that with the effect of greasy or buttery fingers in the average kitchen.

Scores of such tests, both in the laboratory and in the field, proved the qualities and advantages of DULUX before

it was used commercially on refrigerators. Then what happened?

Judge for yourself whether or not this revolutionary new finish is popular with housewives, manufacturers, and dealers alike. *Eighteen months after DULUX was used as a finish on refrigerators for the first time, more than 800,000 household mechanical refrigerators had been finished with DULUX!*

In a new booklet called "DULUX for Refrigerators" you will find the complete, interesting story that will give you added selling ammunition on DULUX-finished refrigerators. You will certainly want to read it. Send for your copy now by writing to E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Delaware.

These facts

ABOUT DULUX HELP YOU SELL REFRIGERATORS

1. *A hard, but flexible and tenacious finish that does not chip or crack under hard blows and surface tension. It is the result of a new, elastic vehicle—a du Pont development.*
2. *A durable finish that resists moisture and protects against corrosion.*
3. *A finish with exceptional resistance to household oils, greases, acids and abrasives.*
4. *A beautiful finish with a texture, depth, and gloss unknown in other finishes.*
5. *A finish with almost perfect whiteness which remains under long outdoor or indoor exposure.*



DULUX for refrigerators

REG. U. S. PAT. OFF.

BEER COOLING

Dealer Must Take Responsibility For Entire Beer Dispensing System

Wyllie Points Out Precautions Necessary in Installing Units if Electric Refrigeration Is to Gain Favor

By John Wyllie, Sales Manager, Temprite Products Corp.

SPEAKING from the standpoint of refrigeration and its application to the cooling and dispensing of beer, it is true that the Prohibition Era very greatly hampered the development of refrigerating equipment and is today creating problems for those who are installing refrigerating equipment for beer cooling, which otherwise might not have been presented. This is always true when the gradual development of an industry is interfered with. Most of the developments in small unit refrigeration took place during the period when it was not legally possible to participate in the dispensing and cooling of beer. Consequently developments in equipment and its application could not be made.

Today, with the repeal of Prohibition, thousands of new beer dispensers are asking for refrigerating equipment and are naturally expecting to find in it the same degree of perfection to which they have become accustomed in other applications of refrigeration.

In altogether too many instances they are not getting this, yet it is not because of the fact that satisfactory beer coolers have not been developed, but rather because so many other factors enter into the dispensing problem with which those connected with the handling of beer are lacking in experience.

Before Prohibition went into effect the entire beer-dispensing industry was a rather closely knit organization. The brewer was closely allied to the

dispenser and saw to it that his product was properly handled throughout all stages of its travel to the ultimate consumer. In many instances the brewer himself provided or at least supervised the operation of the dispensing and cooling equipment and in nearly every instance the beer was dispensed by a man whose long experience in the business had given him a knowledge of the many things which had to be provided for in the cooling and dispensing of the beverage.

As an example of the care with which beer was handled in the earlier days, let us consider one particular establishment which happened to be in the city of Chicago.

The bar itself was a large one and located directly beneath it, in order that the distance between it and the beer might be as short as possible, was the pre-cooling room. In order that the beer might be given the proper attention in the pre-cooling room an attendant was stationed there at all times and a telephone kept him in communication with the

bartenders and on their instructions he tapped the various kegs and regulated the pressure on them as the occasion and circumstances required.

Leading from the pre-cooling room was a large insulated and refrigerated conduit through which the beer lines passed on their way to the bar so that not only was the beer refrigerated both in the pre-cooling room and at the bar itself, but was also prevented from warming up in its passage between the two. As was mentioned earlier, the men who dispensed beer in the earlier days were men who knew their business and the elaborate precautions taken in this particular instance were taken because it was known that they were necessary to deliver to the consumer beer in its finest form.

The essential characteristics of beer have not changed since the days prior to Prohibition, but contrast the conditions just depicted with those found in the average dispensary of today.

Dispensers Lack Knowledge

Many of those who are dispensing beer today are doing so for the first time. They lack knowledge of the nature of beer itself and the way in which it should be handled, either from the standpoint of dispensing or cooling. To many of them a barrel of beer might just as well be a barrel of water and to their way of thinking all that they require is the beer itself and some type of cooler in which its temperature may be reduced before serving it to the customer.

The result of this condition has in so many instances been poor beer, wild beer, flat beer, sour beer, and in general unprofitable business, both from the standpoint of the dispenser and the dealer in refrigerating equipment.

A remedy must be found for this condition if beer dispensing itself is to be profitable and if mechanical refrigeration is going to play an important part in connection with it. As was mentioned, in the earlier days the brewer himself took the responsibility of seeing that the dispensing was properly conducted. Today with the greater need for the spreading of knowledge the brewer is prohibited from participating in any way in the affairs of the dispenser.

Dealer Must Be 'Teacher'

If a satisfactory and profitable refrigerating business is to be built up around the beer-dispensing industry, the dispenser must be trained and educated and it is the writer's contention that those who furnish the refrigeration equipment for the cooling of the beer should undertake this training.

In altogether too many instances today when a prospect for beer-cooling equipment appears, the salesman takes the order for a cooler and compressor and gives little thought to anything beyond this. The cooler and compressor may themselves be perfectly satisfactory but unless the rest of the dispensing system has been properly provided for good beer cannot be obtained from the cooler and in his ignorance the dispenser blames the cooler and mechanical refrigeration receives a set-back.

Mechanical refrigeration today can not afford these set-backs, because insofar as the cooling of beer is concerned it is very definitely on trial, since so many of the older dispensers still claim that ice is the best method for refrigerating beer.

Cooler Gets Blamed

Whenever a system equipped with a mechanical cooler fails to give satisfaction, whether it be the fault of the cooler or not, the old timer points to the instance as additional proof of the superiority of ice and although ultimately his claims will be disproven it simply makes the objective more difficult to reach.

When the beer dispenser of today or prospective dispenser purchases mechanical refrigeration he is purchasing something he knows little about and in many cases is applying it to a business with which he is unfamiliar. He is very definitely then in the hands of the refrigeration salesman and very definitely then is it the responsibility of the latter to see to it that not only is the correct refrigerating equipment sold and properly installed, but also that all other phases of the dispensing problem are taken care of in order that the cooling equipment may be able to work properly and therefore receive the credit to which it is entitled.

Pre-Cooling Necessary

Although much of the responsibility rests on the shoulders of the salesman of the refrigerating equipment, perhaps even more of it falls to the lot of the man making the installation and taking care of the ultimate service.

The problem of cooling and dispensing beer begins with the beer in the barrel as it is delivered to the dispenser and it must be borne in mind that the object of the dispensing system is to deliver the beer to the consumer properly cooled and with all of the desirable qualities which it contained when placed in the barrel by the brewer. One very important factor is the gas content. If the beer

Floral Shop and Beer Tavern



Ottman's floral shop at Elmhurst, Ill., is also a beer tavern. The Seeger bar is at the left, while at the far right is part of the florist's refrigerator.

is to be at its best the CO₂ gas must not be allowed to escape or bleed off from the beer at any point.

Beer is always maintained under refrigeration at the brewery and should be, and, in the majority of instances is, delivered to the dispenser at a temperature under 50° F. Sufficient refrigeration for the keg should be provided so that its temperature will never exceed this. With many coolers keg refrigeration is necessary if the beer is to be dispensed with its proper gas content and without excessive foaming. There are, however, coolers which are capable of taking warm keg beer and properly dispensing it.

Regardless, however, of the drawing characteristics of the beer, pre-cooling should in all cases be provided, because the beer itself is an unpasteurized cereal product and if allowed to warm up for any length of time is bound to suffer impairment of its flavor and quality. The writer has observed many installations in which satisfactory, and even elaborate, precautions have been taken for the pre-cooling of the beer and also for the final cooling at the draft station, yet in which no provision whatever was made for keeping the beer cold between the pre-cooler and the draft station.

Insulation of Lines

Consider for example, an installation in which the pre-cooler is separated from the draft station by a distance requiring a run of 50 ft. of block tin tubing between the two. This amount of block tin tubing will contain approximately 37 oz. of beer and if the tubing is exposed to temperatures of 90 to 100° F., there is nothing to prevent the beer from approaching these high temperatures as it stands in the line when actual drawing is not in progress.

As far then as the beer in the line is concerned, it might just as well not have been pre-cooled. As for the draft station cooler, when this beer is being fed into it it is called upon to handle loads far in excess of those for which it was originally installed. Difficulties from the standpoint of foam control and temperature reduction are likely to result when this condition exists.

To eliminate these difficulties the beer lines between the pre-cooler and the dispensing station should be as short as possible and should also be insulated to minimize heat leakage.

In addition to the insulation of the beer lines the manner in which they are run is also important. They should be free from sharp bends and interior irregularities and should be protected against accidental injury which might kink or close them.

However, although they should be thus protected it should also be borne in mind that it is common practice to replace these lines from time to time and therefore they should not be cemented into channels which make their inspection or replacement difficult. Many a service man has gone through the hard labor of breaking up concrete, where lines have been embedded in floors, in order to find and eliminate a piece of kinked tubing.

Joints in the beer lines should also be avoided as much as possible and any soldered joints should be looked on with suspicion because block tin is difficult to solder and many a joint which looks perfect from the outside may be almost entirely closed on the inside due to the flowing of the lead.

The use of rubber tubing in the beer lines should be avoided wherever possible because of the rapid deterioration of the rubber and its consequent tendency to close the line and impart a taste to the beer.

The location of the draft station cooler is decidedly important because (Continued on Page 11, Column 1)

Novel Florist's Shop Has Seeger Cabinets

ELMHURST, Ill.—Ottman's, a combination restaurant, tavern, confectionery, and wholesale floral shop here, has been equipped throughout with Seeger commercial refrigerator equipment.

The establishment, which is owned and operated by George Ottman, is located at the intersection of North Ave. and Lake St., two prominent highways on Elmhurst's outskirts.

Mr. Ottman is a wholesale florist but because of the prominence of his location he operates a tavern as well as his wholesale florist business. When his tavern was built, it was constructed entirely of glass in the same manner as his greenhouse, but a terrazzo floor was put in a frame built along the outside to accommodate tables on the exterior for people who wanted to eat out in the open.

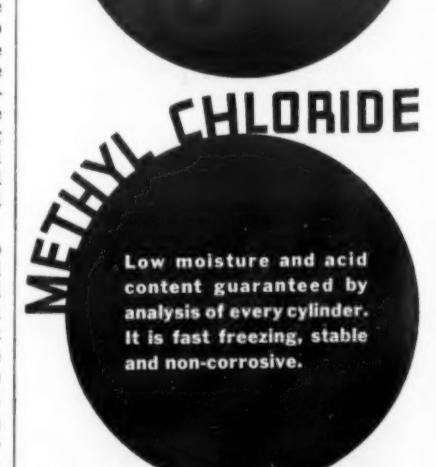
Another advantage of Ottman's location is that he is located across from a cemetery. People visit the cemetery, come over to his place for their lunch, have a few glasses of beer, buy flowers, and return to the cemetery.

As shown in the picture, the entire color scheme is in black and silver. The bar used in the tavern is a Seeger model super 67-44, equipped with a Frigidaire TT12CC cooler.

The florist refrigerator, built by Seeger and refrigerated by Frigidaire, is unusual in a number of respects. It is 6 ft. wide by 4 ft. deep by 9 1/2 ft. high and all walls are three plates of glass with ventilation between the glass to prevent fogging.

The floor is a composition floor and the illumination of the refrigerator is by interior lighting.

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Dealer Problems in Installation of Beer Systems Described

(Concluded from Page 10, Column 4)
after the beer has passed through it there is no further opportunity for cooling. Consequently it should be located as close to the faucet as possible.

If possible, the faucet itself should be in contact with the cooler in order that it may secure some cooling effect from it and thus prevent warming up of the beer as it passes through the faucet and particularly as it stands in it between draws.

Important as is the location of the cooler from the standpoint of temperature control, it is even more important in connection with the control of foam. If the beer between the cooler and the faucet is allowed to warm up the CO_2 gas separates from it and until both the line and the faucet have been cooled by the drawing of beer through them excessive foaming will result.

Design of the faucet is also of importance and many cooling systems today are being criticized when foam is not under control when the entire reason for it lies in the faucet itself. To check to see if the faucet is responsible for foaming, it should be opened wide and the glass not placed under it until after the beer has started flowing. If a satisfactory glass of beer can be drawn in this manner, but not when the faucet is opened directly into the glass, it is evident that the trouble lies in the faucet and regulation of the cooler cannot be expected to eliminate the difficulty.

Pressure Important Factor

The pressure necessary to force the beer through the lines and cooler might be considered as being entirely separate from the refrigerating system, yet it plays so important a part in the proper dispensing of the beer that the refrigeration service man cannot avoid being concerned with it.

In some instances the pressure is provided by CO_2 gas and in others by air. Both methods are satisfactory when used under the proper conditions. When an air compressor is used the service man should see to it that a source of pure, fresh air is provided for the compressor. A compressor which is pumping oil or which is drawing its air from an impure source will definitely contaminate the beer and affect the manner in which it draws. Here again the refrigerating system is likely to be blamed for these results, although in no way responsible for them.

As far as the actual pressures themselves are concerned, there appears to be a rather general impression that a pressure of about 9 lbs. is correct for the air pump or gas drum. In some instances this may be true but not in all because the pressure which should be imposed on the beer keg is dependent upon the amount of CO_2 gas originally in the beer, the temperature of the keg, the height to which the beer must be lifted in order to reach the faucet and the construction of the cooler.

The amount of foam desired in the glass likewise affects the pressure which should be maintained and since all of these items are variables it follows that no one pressure is correct. For each individual case there is a pressure which will give the best results and the refrigeration service man should be sufficiently familiar with the relationship of keg pressure to the various items enumerated so as to be able to determine the correct operating pressure for any set of circumstances.

No Universal Rule

Since different types of beer may require different keg pressures for best results, it follows that a single pressure regulator is not always sufficient where more than one type of beer is being dispensed. In many instances coolers have been removed from service as being defective when the beer in one set of coils drew perfectly, but through the other could not be controlled. Perhaps all that was necessary was independent regulation of the gas or air pressure.

Unfortunately the beer cooler cannot be considered independently from the rest of the dispensing system and faults which may lie entirely outside of the cooling system will be attributed to it when dispensing troubles are encountered.

This imposes a decided handicap on those who install and service beer cooling equipment, but at the same time it carries with it an opportunity. Conditions today in the beer dispensing industry are chaotic and information is lacking. If those in the refrigerating industry, particularly in the service department, will embrace the opportunity presented to them by this condition and will study beer and beer cooling in all its phases so as to be able to locate and remedy troubles, whether they be within the cooling system or apart from it, the beer-dispensing industry will benefit and the refrigeration industry will benefit with it.



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VOL. 12, NO. 16, SERIAL NO. 282, AUGUST 15, 1934

Prospects for Business In Commercial Fields

WHERE does the commercial refrigeration industry stand today? For the last three years or so sales of commercial refrigeration equipment have been in the doldrums. Unlike household refrigerators, which were sold in ever-increasing quantities right through the depression, commercial refrigeration sales followed the precipitous descent of the general business curve.

This year signs of a pick-up in commercial business have appeared. Increase in commercial sales over the corresponding period of 1933 has not been so impressive as the comparison between 1934 and 1933 sales of household refrigerators; but it is enough to be encouraging. World sales of Nema commercial refrigeration equipment to distributors and dealers totaled 58,008 units with a factory value of \$7,722,297 in the first six months of 1934, as compared to 43,304 units with a factory value of \$5,943,535 in the first six months of 1933 ("units" include all commercial applications with high sides, also extra high sides.)

Credit Situation Improved

One thing that stymied sales of refrigerating machines and storage and display cases to commercial houses during the forepart of the depression was the credit situation. Not only were restaurants and food markets passing out of business by the scores and glutting the market with repossessed machines, but the food merchants who did survive were forced to operate with depleted working capital. Many of them literally living and running their businesses "hand-to-mouth." Under such straightened circumstances finance companies were extremely cagey about accepting time payment paper on sales to such concerns.

Returning good business during the last year, however, has reopened the market for the sale of refrigerating machines and display cases to restaurants, grocery stores, and meat markets—the backbone of the commercial refrigeration market. These places are once again becoming eligible for the extension of credit. Added to these depression survivors are dozens of new stores and restaurants which have sprung up in recent months. Both are being earnestly solicited by commercial sales organizations—which have had comparatively little to do in the last two or three years.

Saturation No Great Worry

Saturation of the food serving and food retailing market seems comparatively high when one compares the number of commercial refrigeration installations with the total number of grocery stores, meat markets, delicatessens, restaurants, cafeterias, clubs, and hotels in the land. But that isn't worrying managers of commercial sales crews a bit. They are going

back to these same food serving and food retailing establishments, and selling them *second* and *third* installations. Emphasis has been laid particularly this year upon the sale of display equipment, salesmen working on the theory that no food merchandiser can have too much of his wares on display.

To those distributors and dealers who do worry about saturation, however, manufacturers' commercial field representatives are reiterating the story of the diversified and almost limitless possibilities of the commercial field.

Take dairy products, for instance. Commercial refrigeration applications for milk derivatives include milk coolers for the farm, refrigerated trucks for transporting the milk from farm to dairy, dairy refrigeration equipment (although much of this would come under the classification of *industrial* refrigeration), soda fountains, ice cream cabinets, and counter ice cream freezers.

Beer Cooling Business Better

Beer cooling is a large field in itself for commercial refrigeration. Gradually beer dispensers—hotels, restaurants, clubs, taverns, beer parlors, biergartens, and bierstubes (the more elaborate kind with entertainment)—are changing over from the ice coolers, with which the great majority were equipped when beer was ushered back in 1933, to electric refrigeration. All this has meant a large volume of business for commercial refrigeration distributors this year, and seems likely to offer an even greater volume of business in 1935.

Water coolers still comprise an important division of the commercial refrigeration market, with a long way to go yet before the saturation point is reached. Bakeries are finding more and more uses for electric refrigeration. So are florists, barber shops, mortuaries, hospitals, and other institutions. The list could be extended further.

Two Groups of Manufacturers

Cultivating the commercial refrigeration market are two highly contrasting groups of manufacturers. One is the "big machinery group," manufacturers which hold membership in the Refrigerating Machinery Association. These concerns, such as York, Frick, Carbondale, Lipman, and Brunswick-Kroeschell, are fundamentally *contractors*, and have built their business on the sale of heavy, industrial refrigerating machinery.

The other group is that of the household electric refrigerator manufacturers which are, for the most part, members of the Refrigeration Division of the National Electrical Manufacturers Association. These manufacturers—Frigidaire, Kelvinator, General Electric, Norge, Westinghouse, Servel, Universal Cooler, Trupar, Copeland, and Zerozone (the last three concerns, controlled by Winslow-Baker-Meyering, are not now active Nema members, although Copeland and Trupar were until this year)—are fundamentally *merchandisers*. With each group, the manufacture and sale of commercial refrigeration equipment has been considered an adjunct to their main business—in one case industrial, in the other case household, refrigeration.

Long-Range Possibilities for Volume

Using entirely different sales methods, these two groups are making flank attacks on the sales resistance of the widely diversified commercial market, with success which is increasing as business gets better. Although the household group has been getting the better of the argument, the industrial group has come up fast this year to strengthen its relative position, according to reports from field men.

Those who profess to be long-range students of the refrigeration situation lay great faith in the commercial refrigeration market as the future salvation of the distributor and dealer when household electric refrigerators get more and more into the over-the-counter commodity class. New fields for commercial equipment will be turned up, requiring specialty selling effort, and new applications for present fields will be devised. Especially when one considers the possibilities for more *specialized* types of commercial equipment, it would seem that the race for sales volume from the commercial market has just begun.

LETTERS

Local Refrigeration Codes

Electrical League
18th Floor, Builders Exchange Bldg.
Cleveland
July 31, 1934.

Editor:

It runs in my mind that here a short time ago a brief article appeared in ELECTRIC REFRIGERATION NEWS about an outfit of refrigeration dealers in Madison, Wis., who had gotten together on a code of fair competition and had secured governmental approval of their program.

I've been through my file of ELECTRIC REFRIGERATION NEWS and I'm frankly stymied. Can't find it high nor low—although I did catch the story about Saginaw, Mich., group and have already written them for details.

What we're trying to do here is bring some order out of chaos. We've still a few brothers who believe that profits can be made from volume, even though each individual sale is made at a loss.

Our plan is to secure the assent of 75 per cent of the retail dealers to the proposed Code of Fair Practices; then 75 per cent of the distributors, then take it to the Code Authorities here.

So far the retailers by and large have been for it. We know, from trying to get the distributors in the line on some such program last winter and early this spring, that 75 per cent of them are for it; what I'm trying to get square on is—who do I contact in Washington, D. C., after we're all cleaned up here as to signatures. I thought maybe if someone else had done it, they could give me the story of Who, Where, How, and When.

And I KNOW I saw a story about some local group (not Saginaw) that had got official Washington approval. Can you HELP?

RALPH H. JONES,
Secretary.

Answer: We do not have any record of a local code that had been given approval by NRA headquarters in Washington, D. C.

We might add that under the current policy of NRA officials it is very doubtful if NRA approval would be given to such a local code.

However, it isn't apparent that NRA approval is necessary to make a local code of fair practices enforceable. We have published a number of news stories dealing with the activities of local code-making groups, and perhaps by writing to them you could learn a good deal of the procedure followed in drawing up such a code, and also if it is possible to obtain NRA approval.

The following men can furnish you with information about local refrigeration codes:

G. W. Weston, secretary manager, Electric & Radio Association of Kansas City, 805 Power & Light Building, Kansas City Mo.

S. E. Stewart, Electric Home Appliance Co., Charleston, W. Va.

J. Robert Copping, The Coppingshop, Covington, Ky.

E. W. Banse, Schmoller & Mueller Piano Co., Omaha, Neb.

We have also had correspondence with J. L. Ludlow, chairman of the Local Retail Code Authority, Port Huron, Mich., who has been interested in the formation of a local code of fair competition for electric refrigeration dealers. He might be of assistance to you.

Correction on Prices

Leonard Refrigerator Co.
14260 Plymouth Rd., Detroit
Aug. 9, 1934.

Editor:

We have just awakened to the fact that our release to you announcing the Leonard Electric Chest said that it was "to retail at \$77.50."

The price should have been stated as "\$77.50 plus freight."

If you can work in an item that will clarify this, we should greatly appreciate it.

J. T. STEINKO,
Publicity department.

Two-Gun Sheepherder

(Copy)
King's
First and Walnut
Opposite Montgomery-Ward
Dodge City, Kan.
Aug. 6, 1934.

Mr. John H. Knapp, V. P.
Norge Corp., Detroit, Mich.

Some few weeks ago, we took on Norge and while the business we have done is no great thing so far, possibly due to four years of crop failure hereabouts, they do tell us we are selling more boxes than the other two old established concerns combined.

Dodge City is the authentic Cowboy Capital of the world.

Boot Hill is known the world over as the last resting place of real cowboys who made too many straight passes with dice, had too many aces

in their deck, or who said the wrong thing to some other cowboys sweet katoot.

I don't want to discourage you but the outfit you wear in pictures in ELECTRIC REFRIGERATION NEWS which came in this morning, is a Mexican Sheepherders costume.

Even the children out here know the stories a real cowboy tells about a sheepherder.

If you came to Dodge City with that outfit on I'm afraid they would use you for target practice.

And after the shooting was over they would bury you down by the stockyards.

Real Cowboys are buried with their boots on, on Boot Hill.

W. C. KING.

'Best Trade Paper Known'

5220 Parker Ave., Chicago

Aug. 6, 1934.

Editor:

Enclosed you will find a check for \$47.25 covering 21 subscriptions at \$2.25 each for ELECTRIC REFRIGERATION NEWS for one year. The attached list covers the men of Stewart-Warner Co. who desire the pleasure of receiving the News.

I am under the impression that a 1934 DIRECTORY was offered as a bonus for a definite number of subscriptions. If this offer still holds and the enclosed number of subscriptions is sufficient to qualify, we will be mighty pleased to receive a copy. If not, we still wish the News—the best trade paper known.

W. H. ALLEN.

Answer: The group rate of \$2.25 for 20 or more subscriptions applies to ELECTRIC REFRIGERATION NEWS or the DIRECTORY but does not cover both. We have not offered the 1934 DIRECTORY as a bonus for group subscription orders. Possibly such an offer was made in connection with the 1932 edition. Thank you for your judgment of the News. Coming from a purchasing agent for a corporation which manufactures a wide variety of products for many fields, that's a real compliment.

Offer Accepted

Detroit Lubricator Co.
Trumbull, Lincoln, Marquette &
Viaduct, Detroit, Mich.

Aug. 8, 1934.

Publisher:

I am in receipt of your bulletin dated June 18 to which was attached your check No. 1747 in the amount of 25 cents.

Realizing the statements made in your letter regarding the 1934 delivery and the banks raising Cain for your issuing so many small checks, I am returning the check to you for your own disposition, and will take the amount of the check in liquid refreshments sometime when meeting one of your able assistants.

I. J. KNUDSON.

Editor's Note to Publisher: Knowing the genial Mr. Knudson as we do, we rise to remark that acceptance of this offer is likely to cost "one of your able assistants" considerably more than two bits.

Publisher's Note to Editor: Those rebate checks we issued for REFRIGERATED Food News subscriptions are working out like a lot of other things: It isn't the first cost, it's the upkeep.

Psychrometric Chart

Pfeifer Bros.
Little Rock, Ark.

Aug. 4, 1934.

Editor:

I am anxious to secure a copy of the Psychrometric Chart that the Kelvinator Corp. issued last year.

I understand you had a copy of this published in one of the issues of ELECTRIC REFRIGERATION NEWS, about July, 1933.

I certainly enjoy my copy of ELECTRIC REFRIGERATION NEWS each week and find it very beneficial to me in my work.

CHAS. K. VANCE.

Valuable Assistance

Smith Electric Co.
Bloomington, Ind.

Editor:

In order to meet the requirements for a Masters Degree at Indiana University, I am preparing a thesis on "Controls for Household Electric Refrigerators."

I have purchased your 1934 REFRIGERATION DIRECTORY and it has already been of valuable assistance to me in my work on this thesis.

GEO. SMITH.

Where to Stay?

17 Lefferts St.
Brooklyn, N. Y.

Editor:

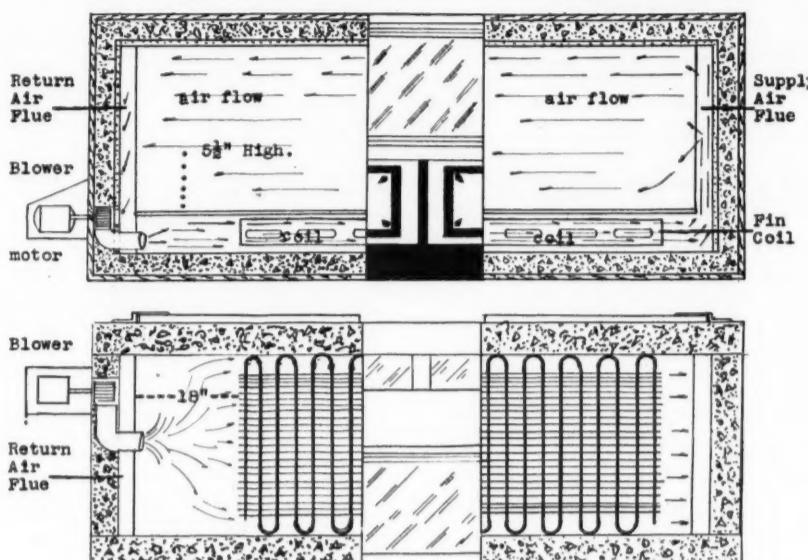
This request may surprise you as it is something out of order.

As I am one of your readers on arrival and have been interested in the write-up of the Chicago Fair on air conditioning. As a service man I am not heavy with money, so I am looking for a place to stop in Chicago where I won't have to buy the hotel to stay for about five nights. I figure to spend about \$100 for the trip. Could you let me know of a place to stop at? I want to hit Chicago on Aug. 18, 1934.

R. P. GOODRICH.

COMMERCIAL REFRIGERATION

Forced Air Distribution in Display Case



"Air conditioning" for refrigerated display cases as developed by Ridgway Refrigerator Co. of Philadelphia is shown above. Top drawing shows a cutaway section, front elevation. Bottom cutaway drawing is looking down at coil under storage compartment flooring.

McCray Announces New Display Cases

KENDALLVILLE, Ind.—Featured by their simplicity of design, two new display cases and a floral display box are being introduced by McCray Refrigerator Sales Corp. here. One of the former is a top-display model, the other being of the double-duty type.

The double-duty case, available in 10- and 12-ft. lengths, is designated as model 930, and is identical in appearance to the new top-display case—also made in lengths of 10 and 12 ft.—except for its storage compartment.

Front, top, and ends of these cases are white porcelain trimmed in black, and the back is black porcelain. Walls are insulated with 3 in. of corkboard sealed with hydrolene. There are three thicknesses of glass at the front, all running the full length of the case without obstruction.

In both cases, there is a fin coil above the display compartment, not visible from the front, and a tubular coil beneath the food pans. Coils being of the diffusion type, McCray engineers are recommending that a compressor with a capacity of 2,100 to 2,400 B.t.u. per hour be used with the cases.

Beneath the fin coils at the top of the cases is a continuous pan, bottom of which is covered with rubber. This reduces materially the amount of moisture collecting on the underside of the pan, and prevents dripping on the foods below, explains H. M. Stewart, vice president and general manager.

Another feature of these cases is their use of a device to prevent light glare from striking the customer's eyes. The device is a hinged strip running the entire length of the overhanging panel under which the lamps are installed. The strip is at the bottom of the panel and under the lights, and prevents visible reflection of the latter in the glass at the front of the case.

Construction of the cases is such that no screw heads are in sight in the porcelain panels. Interior of the display compartment is of white porcelain. The doors of this compartment are made of a composition substance, have three thicknesses of glass, and have porcelain exteriors and interiors.

Model 930 in the 10-ft. length sells for \$996 f.o.b. factory, the 12-ft. model for \$1,195 f.o.b. factory. Model 910 (10-ft. top-display model) is priced at \$814 f.o.b. factory, and model 912 (12-ft. top display) has an f.o.b. price of \$942.

Both cases have a scale stand at the back, 21 in. wide, 20 in. deep, and 35 in. from the floor. Beneath the stand are two adjustable sliding wrapping shelves.

Available shortly will be a double-duty model similar to these just described except that it will have built-in conventional coils instead of diffusion-type—an overhead coil and a 3x7 booster-type coil in the storage compartment.

McCray's new florist's box, model 800 is designed especially to meet flower retailers' demand for lightweight equipment with a minimum of decorative gadgets. It is 6 ft. wide, 3 ft. deep, and 8 ft. high, and will sell for \$480 f.o.b. factory.

It is made of black wood with stainless steel trimmings, and the exterior of top section, in which the refrigerating unit is housed, is staggered to give the case a modernistic style effect. There are two sliding doors, and the bottom of the display compartment is covered with a cork composition. The case has no mirrors.

Temperatures Closely Controlled in Food Store Installation

By F. H. Meade
Westerlin & Campbell Co., Chicago,
Direct Factory Representative,
York Ice Machinery Corp.

THE National Tea Co. of Chicago, operator of one of the country's largest food store chains, has recently opened a new super-service store at 800 Elm St. in Winnetka, Ill., which is air conditioned and equipped throughout with the latest type refrigerating equipment.

A York refrigerating machine of the standard 4x4 two-cylinder commercial type, 5 hp. is used to cool the space within a large display window, which is approximately 8 ft. long by 4 ft. deep by 6 ft. high. The refrigerating machine maintains a temperature of 37 to 40° in this window area, without variation.

In this window there are approximately 350 sq. ft. of finned surface, placed in an overhead bunker, with about half of that amount of the finned surface passing directly beneath a series of three display shelves, upon which the meat pans rest.

The York compressor also cools an 8x16x10½-ft. meat cooler, which is insulated with 4 in. of cork, and maintains within this cooler a temperature varying from 34 to 36° F.

Special designed display cases, each approximately 48½ ft. long are made in six sections or compartments, consisting of delicatessen cases, fresh meat cases, smoked meat case, and fish case. These cases are fitted with coils, and a constant temperature of 38° F. is maintained within the cases.

In addition to these cases, an 8-ft. case for bottled goods is refrigerated to a temperature of 46 to 48° F., as are two self-service cases in which are kept such commodities as milk, package cheeses, etc. An 8-ft. egg case is also kept at 44 to 46° F.

In addition to the foregoing fixtures, the York unit refrigerates a produce cooler, specially designed for the wet storage of vegetables. In place of the usual coils, this cooler is equipped with an aluminum blower unit, which has a capacity of 6,000 B.t.u.'s per hour. A temperature of 42 to 46° F. is maintained within this cooler.

Seventeen thermal valves were used with the 5-hp. York refrigerating machine, so that the desired uniformity in results, and close control of temperatures in the refrigerated areas could be maintained at all times.

A special type of hard drawn copper tubing was required for all liquid and suction lines on this installation, and fittings are of the Mueller "streamline" solder type. Though the installation involved the use of more than 275 of these solder fittings, it is a matter of interest to mention that, when final tests were made preliminary to turning the equipment over to the purchaser after the installation was completed, only three minor leaks were located.

G-E Installs Units for Airport Restaurant

CLEVELAND—General Electric "conditioned-air" refrigeration equipment has been installed in the Acme Grill at Municipal Airport here. It cools a 60-cu. ft. meat cooler, a back bar fruit display cabinet, a back bar butter and water dispenser and two beer dispensing and cooling units.

Seeger Introduces New Line of Cases

ST. PAUL—Distinguished by a number of new features in design, a "new five" line of display cases constructed for use with mechanical refrigeration has been introduced by the Seeger Refrigerator Co.

The new series of cases come equipped with refrigeration coils of Seeger design. The first coil and baffle assembly located in top of the display compartment is an extra large cross-finned direct expansion evaporator; the second coil is the diffusion evaporator type, located on the front wall of the bottom storage compartment.

There are three shelf levels in the display compartment, with the bottom shelf adjustable so that it can be level or raised at the back. A complete set of heavy porcelain platters is furnished with each case.

The all-porcelain case has been so constructed that there are no sharp edges. A light green design has been fused into the porcelain to present a decorative effect on the front.

Case is insulated throughout with 3 in. of corkboard wrapped in center asphalt coated water proof paper and sealed to the frames with hydrolene.

Service doors are of moulded hard rubber, sliding on a hard rubber track, equipped with roller bearings, large finger grips, and rubber bumpers. Upper track of the service door assembly is fitted with a special live rubber air lock.

Kold-Hold Equips 15 Ice Cream Trucks

SCHENECTADY—Fifteen refrigerated trucks operated by the General Ice Cream Co. of Schenectady have recently been equipped with Kold-Hold units.

The Hussmann-Ligonier model V410 is equipped with coils designed to maintain proper humidity for the display of vegetables.

'Dual Coils' Are Feature Of New Hill Model

TRENTON, N. J.—Several new features are incorporated in the new 4100 refrigerated display case introduced by C. V. Hill & Co. for operation with electric refrigeration.

The case is equipped with dual coils—one coil located behind the display case and another in the top of the case.

Greater pitch of the front glass makes it possible for the customer to get a better view of products displayed.

A porcelain floor is standard equipment in model 4100. This facilitates cleaning, eliminates deterioration of the floor, and adds to the general appearance of the case.

Extra insulation is provided in the form of a special insulating board, in addition to the regular cork. A layer of this board, inside and outside, covers and insulates the entire framework.

Refrigerated Case Ends Spoilage of Vegetables

TAYLORVILLE, Ill.—A mechanically refrigerated Hussmann-Ligonier "humidicoiled" display case has been installed in the food market operated here by A. B. Titron.

The display of highly perishable vegetables and fruits during the hot months had been a perplexing problem to Mr. Titron, so he finally decided upon the installation of a refrigerated display case.

The Hussmann-Ligonier model V410 is equipped with coils designed to maintain proper humidity for the display of vegetables.

Refrigeration is supplied by a York ammonia refrigerating machine.

Holcomb & Hoke Case Has 'Load Retarder'

INDIANAPOLIS—A service load retarder between the top display shelf and bottom compartment is a principal feature of a new double-duty refrigerated display case just introduced by The Holcomb & Hoke Mfg. Co. here.

The retarder is said to act as a "dam." Lower doors may be opened as often as is necessary, without an outrush of cold air.

Another feature of the new H & H double-duty case is an airflow stimulator in the lower compartment which provides sufficient air movement to keep all parts of the case properly refrigerated.

The top service doors are built above the display shelf providing a "cold blanket" over the fresh cut meats on the display shelf.

An open-type cold air distributor baffle is used in this case. The baffle is of porcelain.

Accessory features include automatic lights, meat hooks in the lower compartment, and moulded hard rubber sliding doors with moulded hard rubber frame around the door opening.

Frigidaire 'Flowing Cold' Unit Precools Beer

MILWAUKEE—The huge dining room, tap room, and room service demand for beers and ales moved the Hotel Schroeder here to build an elaborate pre-cooling room for storage of necessary supplies of beverages.

The installation, made by the Sieg-Milwaukee Co., Frigidaire distributor, consists of the new type Frigidaire "flowing cold" refrigeration unit which forces the refrigerated air into every section of the 16x18-ft. room.

Whatever opinions may be held by the trade and the public on the relative superiorities of various makes of electric refrigeration equipment, all agree on this: Universal Cooler units are good products and none give better or more dependable performance.



UNIVERSAL COOLER CORPORATION
DETROIT, MICHIGAN

MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION EQUIPMENT

ELECTRICAL INDUSTRY OPPOSES RMA CODE EXEMPTION

Nema Heard at Second Portion of NRA Hearing

Lawyers Handle Radio Men Without Gloves In Aggressive Testimony

Published in last week's issue was the initial portion of the text of public hearings held July 23 in Washington on the petition of the Radio Manufacturers Association for exemption from the NRA code of fair competition for the electrical manufacturing industry.

That part of the hearing published last week dealt chiefly with the RMA's formal petition for exemption as presented by Bond Geddes, executive vice president, RMA, and Capt. William Sparks, chairman, code committee, RMA.

In its petition RMA cited four main reasons as to why it should have a separate code: (1) that self-government, a cardinal principle of the NRA, could not be accomplished in the radio industry if it was under the electrical code; (2) that industry independence was impossible for the radio industry if RMA members should all join the National Electrical Manufacturers Association; (3) that efficient and less expensive code administration could be accomplished under a separate code; (4) that the trade practice provisions of the electrical code failed to meet special problems which confront the radio industry.

Much of the arguments presented were designed to show that the radio industry is big enough and important enough to merit its own code, and to show in what ways the administration of the electrical manufacturing code has proved unsatisfactory.

W. J. Donald's Statement

Statement of W. J. Donald on Behalf of the National Electrical Manufacturers Association

Mr. Donald: Mr. Administrator, on June 28, 1934, J. S. Tritle, president of the National Electrical Manufacturers Association, addressed a letter to Deputy Administrator J. G. Cowling, reading as follows:

The Code Authority of the Electrical Manufacturing Industry, having anticipated a possible request for a separate Radio Manufacturing Industry Code and request for release from the Electrical Manufacturing Industry Code, have considered the problem and with the unanimous request of sections of Nema interested in the manufacture of radio and radio parts, decline to give the release requested by the Radio Manufacturers Association. The objections of the interested sections of Nema and their appeal to the Code Authority of the Electrical Manufacturing Industry will be presented and any additional factual data required."

This brief will be presented under the following main headings:

I—Basic objections to the request for exemption.

II—Comments on the letter of application for exemption presented by Mr. Bond Geddes, executive vice president and general manager of the Radio Manufacturers Association, dated June 27, 1934.

III—Objections of sections of the electrical manufacturing industry and of the National Electrical Manufacturers Association.

IV—Summary.

Section 1—Basic Objections to the Request for Exemption

The objections of Nema and the Code Authority of the Electrical Manufacturing Industry to exemption of the Radio Manufacturing Industry, so called, from the definition of the electrical manufacturing industry code are as follows:

(1) The Radio Manufacturing Industry, so called, and the definition proposed by the RMA in a code which they propose to submit, providing they secure exemption from the electrical manufacturing industry code, would make of a radio manufacturing industry code a horizontal code, which would cut across the electrical manufacturing industry code and also the furniture manufacturing industry code in particular, and a number of other codes, such as metal stamping, screws, molded products, etc.

The effect of such horizontal codes is to place the same or practically the same products under the horizontal code, such as the proposed radio manufacturing industry code, when used for the particular purpose of sale into the particular markets, and leave them under one or more

other codes when used for other purposes or sold into other fields of application.

We believe that this is an essentially unsound principle in code drafting and should not be countenanced by the NRA.

Many code authorities have been irritated and plunged into confusion by such horizontal codes, and such code authorities have come to expect that no additional codes of the horizontal type would be countenanced.

One of the great disadvantages of such horizontal codes is that they make compliance very difficult, if not impossible, to secure because they create a state of uncertainty as to the proper jurisdiction of codes of fair competition over such products, and open the opportunity for evasion which appears to be accidental or due to misunderstanding, but which is sometimes wilful. In fact, such horizontal codes are raising hob with effective compliance.

The effective operation of a code authority in its duties of administering and especially in securing voluntary compliance with the code receives serious interference, creates misunderstanding and ill will, increases expense, and draws quite unnecessarily on the time and energy of members of code authorities, and on the energy, patience and good will of the executives of NRA.

Specific illustrations of the unsoundness and disadvantages of such a horizontal code will be presented in the course of consideration of the effects of approval of radio manufacturing industry code on particular sections of the electrical manufacturing industry.

A substantial number of members of the electrical manufacturing industry would be very adversely affected by the necessity of operating under both the electrical manufacturing industry code and the proposed radio manufacturing industry code.

Illustrations of these disadvantages will appear in our consideration of the effects on particular sections of the electrical manufacturing industry.

Exemption of the so-called radio manufacturing industry from the provisions of the electrical manufacturing industry code would be contrary to the announced policy of the Administrator for National Recovery to combine basic codes so far as practicable and to bring code making to an end within 30 days from July 6.

All industry welcomes an announcement that permits the NRA to turn their attention from code making to code administration and code enforcements.

We recognize too that the Administrator for National Recovery has in mind, in announcing his policy, the possibilities of a long range program of industrial and economic planning, and inter-industry and trade planning.

The electrical manufacturing industry, as represented by the products now embraced under the definition of the electrical manufacturing industry, is a good example of the benefits of integration between sections of an industry which accrue not only to the industry, but also to labor and to the public from a basic code of fair competition incorporating an entire industry in which is embraced a large number of products and all the basic elements thereof.

The proposed definition of the so-called radio manufacturing industry appearing in the proposed code which we have received embraces products which have always been recognized as electrical manufacturing industry products, with the exception of radio cabinets, metal stampings, screws, etc. which are similarly recognized as products of other industries.

Radio Developed By Electrical Industry

There is in a radio receiving set for household use nothing except products which are and always have been recognized as electrical and which have come into being as the technical progress of the electrical manufacturing industry has advanced, with the exception of some other products specified above or raw materials which properly are classified under other industries.

The definition of the electrical manufacturing industry in the electrical manufacturing industry code of fair competition makes provision that organizations or groups of employers representing a substantial part of any branch or subdivision of the industry may be exempted from the provisions of the code by the Administrator.

I might say, Mr. Administrator, in passing, that, with no interest whatever in cabinet-making, we may say impartially that radio cabinets are clearly a part of the furniture manufacturing industry.

Such exemption has been granted by the Administrator to (a) The vacuum cleaner manufacturing industry. (b) The washing machine manufacturing industry. (c) The storage battery manufacturing industry. In each of the cases specified above, exemption was granted by the Administrator without protest from Nema or the code authority for the electrical manufacturing industry.

We understand that a number of directors are opposed to such exemption and it is a fair assumption that some of them voted in favor of requesting exemption in expectation that the request for exemption would not be granted by the Administrator.

Horizontal Code Has 'Vicious' Character

In none of these cases did the definition of the industry take on the vicious horizontal character illustrated by the proposed definition of the radio manufacturing industry. In the case of vacuum cleaners and washing machines, the electrical product content of the assembled product is a minor portion.

Moreover, these exemptions were made prior to the recently announced policy of coordinating codes and of reducing the number of basic codes which the Administrator has from time to time emphasized during the last few months, and before the possibilities of intra and inter-industry planning and coordination began to dawn upon us.

What This Hearing Means To the Refrigeration Industry

This report of the hearing on the radio industry's plea for exemption from the NRA code for electrical manufacturers is published in ELECTRIC REFRIGERATION NEWS because:

(1) The radio and electric refrigeration industries are closely related. Many of the radio manufacturers who were represented at this hearing are also manufacturers of electric refrigerators. Moreover, a large portion of electric refrigeration distributors and dealers also handle radios.

(2) National Electrical Manufacturers Association not only controls the radio industry (as far as NRA matters go) through the Nema code, but the electric refrigeration industry as well. Although the refrigeration industry is apparently satisfied with its relations to the Nema code and governing body thus far, it is important for refrigeration men to note the experience of the radio group in this connection.

(3) This example of procedure under NRA rules is of interest to business men inasmuch as it helps to clarify the true meaning of "self-government in business." (See note at top of page 16.)

Nema and the Code Authority for the electrical manufacturing industry are emphatically opposed to the idea that part of a basic product classification should be exempted from one code just because a slight or special adaptation to a particular use is incorporated into some products under that classification. Most of such modifications of products are not really adaptations—rather they are merely differences in size, specification, shape or dimension.

The fact that a few manufacturers of a particular product concentrate on the sale in a particular field of application does not justify classifying that product as an entirely different item of production. In fact, to so classify a particular product is in number of cases imposing on industry an unnecessary burden of energy and expense, and on the NRA executives a waste of their time, energy, and patience.

Nema Spokesman Belittles Activities of RMA

RMA has been in existence for approximately 10 years. Practically all of the standardization work so necessary in connection with the development of the products known as radio was done in the electrical manufacturing industry through Nema and its predecessors, with the aid of the engineering talent within the electrical manufacturing industry and on the staff of the Nema.

RMA has devoted itself almost exclusively to trade shows and trade promotion, the history of which is a story in itself.

Standardization development languished when manufacturers of receiving sets for home use withdrew from membership in Nema.

Manufacturers of electrical products other than manufacturers of radio receiving sets for home use, who are members of the RMA, belong to RMA only for commercial considerations or "business" purposes.

Comments on RMA Letter of Application

Section II—Comments on the Letter of Application for Exemption Presented by Bond Geddes, Executive Vice Pres. and Gen. Mgr. of RMA, Dated June 27, 1934

Nema unfortunately can not fail to comment and protest some of the statements appearing in the letter written by Bond Geddes, executive vice president and general manager of the RMA to the Administrator of the National Recovery, dated June 27, 1934.

Our comments and protests are as follows:

1. Unanimous Action of RMA Board.

We know because we have written statement to that effect that the action of the board of directors of the RMA in favor of requesting exemption from the electrical manufacturing industry was not unanimous.

We understand that a number of directors are opposed to such exemption and it is a fair assumption that some of them voted in favor of requesting exemption in expectation that the request for exemption would not be granted by the Administrator.

2. Self-Government.

The acceptance of the principle of self-government in industry does not constitute the specifications of an industry or a definition of an industry.

What the RMA have attempted to constitute as an industry in the definition in the proposed code which the RMA have sent to Nema is not an industry, but an aggregation of employers some of whom have a definite interest and their effort to prepare a definition for a so-called industry consists of trying to take jurisdiction over products, many of which have been and still are electrical products, and others of which are products of the furniture industry, together with some minor product items, such as screws, metal stamping products, etc. It takes more than the affiliation of a group of employers to constitute an industry.

Manufacturers of receiving sets for

by the organized manufacturers of sets and approved without modification of any kind by the Code Authority. In no case has the nomination made by any product classification within the electrical manufacturing industry been modified by the Code Authority.

We desire to point out that no other sections have ever made objection to supervision by the Code Authority, or to the approval of the appointment of the supervisory agencies by the Code Authority and none of them had cause so to do.

The fact that the Code Authority for the electrical manufacturing industry contains persons who have no interest or at least no direct interest in the so-called radio business has been found by various product classifications and by the electrical manufacturing industry as a whole to afford assurance of neutrality and impartiality in any particular controversy. This substantial body of impartial persons within the Code Authority insures the utmost of fair treatment in case of any controversy within any product classification and precludes the possibility of favoritism such as might obtain if decision in regard to controversy rested entirely with interested parties.

If the request for exemption by NRA were granted a substantial number of electrical manufacturers would be obliged to operate under two codes for electrical products, thus destroying the self-government for which Bond Geddes appeals. This at least would be true if the definition of a radio manufacturing code embraced all of the products covered by the proposed definition which we have seen. The fact is that their proposed definition would subject manufacturers of parts including cabinets to the reverse of industrial self-government by placing such manufacturers of electrical products which enter into another completed electrical product under the jurisdiction of the customers of those manufacturers of parts.

It is not industrial self-government to subject suppliers of parts to the government of the purchasers of those products.

Are Radio Men Represented on Council?

Bond Geddes makes the statement that radio manufacturers have no representative on the electrical manufacturing Code Authority. It is true that no manufacturer of radio receiving sets for household use is represented on the governing body of the Code Authority. It is not true that manufacturers of electrical parts which are incorporated into radio receiving sets for household use are not represented on the governing body of the Code Authority. Manufacturers of radio transmitting apparatus are, and several other such electrical products are so represented.

Furthermore, the proposed amendments to the electrical manufacturing code make provision for election to the Code Authority of members of the industry who are not members of Nema.

The governing body of the Code Authority does not represent only large manufacturers of electrical equipment. Large manufacturers are represented on the governing body of the Code Authority but there is a substantial number of medium size and small manufacturers of electrical equipment—in fact, 23 out of 30.

3. Industry Independence.

The founding or the existence of a radio manufacturers' association or any other association does not of itself create a separate industry. Indeed, as we pointed out above, it is dependent upon the electrical manufacturing industry and there is no evidence that it will ever be independent of the electrical manufacturing industry, either economically or technologically.

Reference is made by Mr. Geddes to annual sales of over \$200,000,000 in 1933. The statistical evidence available through the statistical department of the Code Authority for the electrical manufacturing industry checked by figures of the Internal Revenue Bureau on returns from excise taxes indicate that the volume of radio sales for the year ending June 30, 1933, was as follows:

Receiving tubes	\$16,100,000
Receiving sets for home use	27,600,000
Transmitting apparatus	4,400,000
Transmitting tubes	1,800,000
Public address systems	670,000
Commerce receivers	658,000
Receiving sets, parts and accessories	9,800,000
Total	\$61,028,000

It may be that the difference between the \$60,000,000 and the \$200,000,000 figure is the difference between manufacturers' prices and retail prices.

Mr. Geddes seems to confuse the identity of industry independence and RMA independence. He seems also to identify the existence of a trade association with exclusive administration of a Code of Fair Competition. Nema has no objection whatever to continuance of an association devoted to trade promotion, traffic or other services to manufacturers of receiving sets for home use or for other products. Mr. Geddes' comment on industry independence is rather clearly an appeal for a separate code in order to facilitate maintenance of the continued existence of RMA. Nema continues its existence by virtue of being an effective trade association.

There exist in Nema 176 separate, yet coordinated divisions, sections, groups and sub-groups which are operating satisfactorily on the basis specified above. The beneficial results of such operation depend largely upon the manner in which the advantages of the organization are recognized and realized by the members of the respective sections and groups. That the system has worked well is indicated by the fact that the number of such sections and groups has increased from 65 a year ago to 176 at present, and

(Continued on Page 16, Column 1)

AIR CONDITIONING

Notes

By John T. Schaefer

Windowless Store

Something very new in department stores will be the one which Sears Roebuck is having erected on Chicago's South Side. It will be a completely windowless store, the only outside light being introduced to the four selling floors by four towering columns of glass which will rise vertically from the roof. This will be for customers who want daylight to inspect fabrics.

By eliminating windows, Sears expects to increase usable floor space by 15 per cent, abolish all outside noises, and reduce most of the merchandise depreciation which comes from dirt and dust—nine-tenths of which comes through open windows.

The new building (cost a million and a half) will be air conditioned from top to bottom. Most inter-floor traffic will be by escalators.

For Hayfever Sufferers

Business Week says Mandel Bros. is providing a special room in its newly air-conditioned basement for hayfever sufferers. Here they can retreat from the offending dust and pollen into a room with washed and conditioned air.

Offices with air conditioning are also said to be flattening out the vacation curve, there being less of a rush to get away for the hot weeks of summer.

Move Along, Please

The many air-cooled exhibits at A Century of Progress, together with Chicago's share of the recent heat wave, have combined to bring thousands of people to a consciousness of the comforts of air conditioning.

In fact, these exhibits are so comfortable that attendants frequently have difficulty in keeping visitors from becoming overcrowded with hot, slow-moving visitors.

And when they get outside, they're almost always heard to remark, "My, but it's hot out here."

New Refrigerants

A breeding place for rumors of new refrigeration processes and materials, Chicago is just now hearing stories of one or two new refrigerants which are expected to see the market early in 1935.

According to our sketchy report, two large oil companies are working on the problem, and hope to have something of interest for air-conditioning engineers. What seems to please certain Chicagoans chiefly is the prediction that the new gases will be freely available to all factors in the industry.

Dry Ice' Comfort Cooling'

Press releases from Purdue University bring the story of a new wrinkle in comfort cooling—by dry ice applied to the human wrist. Dry ice is placed in some sort of a small case which is strapped to the wrist, but which prevents "burning" of the skin by proper insulation.

The device maintains a cool spot on the wrist (or any other part of the body desired) and extracts heat from blood flowing in the arteries. It is supposed to have a soothing effect on the heart, especially during hot weather, and is also claimed to help relieve fever patients.

Larger Water Valves

With 10-, 15-, and 20-hp. automatic condensing units now on the market for air conditioning and even larger ones expected for sale in 1935, installers and designers have faced something of a problem in finding condenser water regulating valves with sufficient capacity.

So brothers C. F. and E. M. Toussaint of the Chicago Electromatic Engineering Co., builder of a small water valve which has been rather extensively sold for replacement purposes, have designed a new water valve in sizes from $\frac{1}{2}$ to 2 in.

The new valve is of the bellows-operated type and is claimed to be quite sensitive, opening and closing on as low as a 10-lb. range in pressure—a desirable feature for use with Freon air-conditioning systems.

According to the Messrs. Toussaints' plans, it will be sold principally to manufacturers. It is already being used by Westinghouse, Frick, and Universal. For further details, watch the News.

Air Conditioning for Buses

Just how soon the cross-country passenger bus will follow the railroads

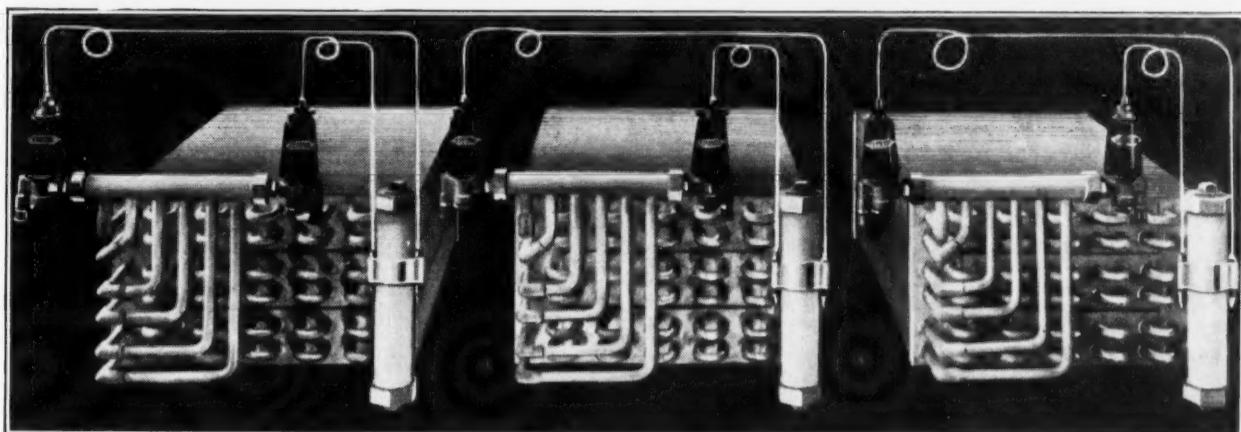
in adoption of air conditioning is a question of economics as well as engineering, as it involves a number of new technical problems.

The Greyhound people, it is reported, have been experimenting in cooperation with the Modine Mfg. Co. of Racine, Wis., in development of a bus air-conditioning system. For driving the compressor, both independent gasoline engines and power take-offs have been studied, with the former enjoying the current preference.

Box Car Diners

Experience of the Broad Street Diner in Elizabeth, N. J., which recently installed a Carrier air-conditioning system and built up a loyal trade with it, has appealed to the proprietor of the Valley Diner, nearby in Montclair, N. J. The latter has just ordered one for his diner too.

Battery of Fedders Coils for Cooling the News' Offices



Seven and a half tons of refrigeration are furnished by the above battery of cooling coils used in the air-conditioning system now operating in the new home of Electric Refrigeration News. Each of the three units shown above consists of three sections connected to the headers in multiple. The Freon refrigerant is fed

into the coils by Fedders model 33 thermostatic expansion valves, there being two valves on each of the three units. The finned portion of each coil is 18 by 11 by 28 in. A detailed description of the complete air-conditioning system will appear in the Aug. 29 issue of Electric Refrigeration News.



*protects school children
by keeping fountain water*

COOL and SAFE!

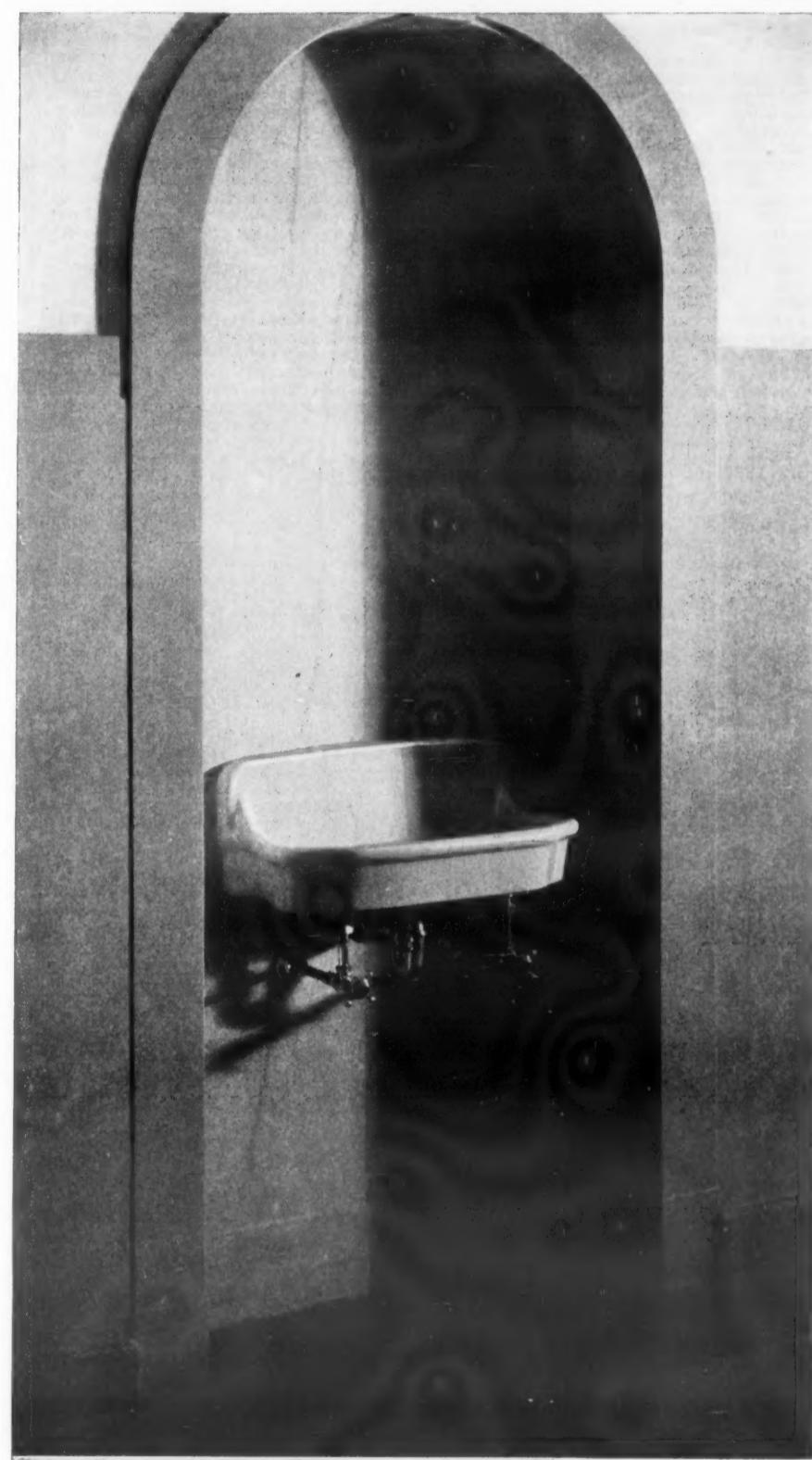
School boards are now including in their specifications for new schools a provision that the drinking water for fountains be cooled by "Freon" in direct expansion coils, immersed in the supply tank of the drinking water system. These systems are cheaper, easier to install than the old-fashioned brine systems, and provide the maximum protection and safety for children.

Standard milk cooling units make splendid water coolers, and it is not difficult to run the lines even in the "little red brick schoolhouse" and provide the children with water at the required temperature.

In order to give students in Philadelphia schools fullest protection, the School Board chose "Freon" as the refrigerant. This refrigerant is *safe*. It is non-poisonous, practically insoluble in water and cannot alter the taste, odor or purity of water. "Freon" keeps the water refreshingly cool which imparts added zest to students for both study and play.

Consult school authorities in your city and suggest the installation of "Freon" refrigerating systems—not only for cooling of fountain water, but for the *air-conditioning* of classrooms. They are prospects.

And there are many other places where "Freon" may be sold, whether for refrigeration or air-conditioning, or for both. Hotels, office buildings, apartments, homes, restaurants, meat markets, delicatessens, florists' shops, and countless others.



Girl's Senior High School, Philadelphia, Pa. "Freon" water-cooling system by York.

FREON REG. U. S. PAT. OFF.

a safe refrigerant

NEMA LAWYER RIDICULES RADIO MANUFACTURERS' PLEAS

Neagle Brands RMA's Figures & Claims False

(Continued from Page 14, Column 5)

the number of members has increased from about 250 to about 650 in the same time.

Administrative Expense.

More efficient and less expensive administration has been and can be accomplished under the electrical manufacturing industry code than under a separate code for any section of the electrical manufacturing industry.

The records show that the cost of administration for the electrical industry is substantially lower than the cost of administration of codes under which smaller groups of manufacturers operate in all but a relatively few special industries.

I might say at that point that Nema has assumed the responsibility of getting voluntary compliance under the Code and their expenses that are necessary to get that voluntary compliance.

Operation under the electrical manufacturing code has been economical because the specialized talent and services necessary have been spread over a large volume of production and sales. It has been found possible to have expert talent familiar with association law and with trade practice law.

The Code Authority is equipped with accounting and statistical staffs, second to none in organized American industry. It has the services of a well-manned and competent engineering department, also a Uniform Legislation Department. In addition it has secured, trained and coordinated, a code administration staff, partly from within the electrical manufacturing industry and partly from within NRA; all of which enables Nema to perform a thorough job of code administration and economically and efficiently.

Such services are not available to smaller industries. The fifth largest industry in America has kept its operating expenses during the first year of code administration very substantially below the costs that have been borne by the substantially smaller industries.

Such results, however, would not be of final significance were it not for the fact that the electrical manufacturing industry is credited in NRA with being one of the three best organized and of having done one of the best jobs of code administration and of securing voluntary compliance with its code.

If all manufacturers of radio receiving sets had contributed to the expense of the Code Authority for the electrical manufacturing industry the burden on individual members of the electrical manufacturing industry would have been still lighter. As it is, only one radio set manufacturer has contributed.

Letters to RMA Member Disclosed

It is appropriate at this point to call attention to the manner in which the RMA has conducted its relations with the Code Authority for the electrical manufacturing industry. We call attention to a letter to a former member of the RMA from Bond Geddes, executive vice president and general manager, dated Oct. 5, 1933.

Your letter of Oct. 4 tendering your resignation from the RMA because of your organization in Nema of a transformer section for code administration is received. I am sure you are misinformed regarding the necessity or advantages in such action and hope you will reconsider your resignation. The RMA tube group recently formed a tube section of Nema but not one resigned from RMA. The code is a temporary matter, while the RMA will continue its functions and services to members which you have supported and assisted for so many years.

Furthermore our last RMA news bulletin (copy enclosed) informed all members of the appointment of Messrs. Arthur T. Murray, president of the United American Bosch Co., and Leslie F. Muter, president of the Muter Co., as code supervisors for the radio industry. This is under agreement with Nema and afford all code action and advantages without RMA members joining Nema and thus bearing additional expense. Therefore, it is planned that Mr. Muter will be the active code supervisor for radio parts and accessory manufacturers, including those making radio transformers.

Your company is in position to secure all privileges of the electrical code under the above plan without the additional cost of Nema membership and Nema code administration. Your dues in RMA are not large and your many years of membership have indicated that you regarded its many services as sufficient value to warrant continued affiliation. All of these RMA activities and services, plus industry code administration will continue to be available to you as a member of RMA, and it is earnestly hoped that you will reconsider this matter and withdraw your resignation from RMA.

We point out that the executive vice president and general manager was informing radio manufacturers that they need not bear any cost of code administration under the administration of the electrical manufacturing industry code.

Nema Rejects RMA Offer of \$25,000

Subsequently at a meeting of the Code Advisory Committee, Messrs. A. T. Murray and L. F. Muter, being in attendance by invitation, informally offered on behalf of RMA to pay Nema \$25,000 per year for

code administration services. This offer was rejected by Nema on the grounds that it was not a proper arrangement.

RMA wrote a letter, dated Jan. 29, 1934, to A. T. Murray, Supervisory Agency for the Radio Receiving and Television Sets for Home Entertainment Classification, and sent a copy of that letter to all the Directors of RMA, in which it was stated that, in conversation with representatives of RMA, A. D. Whiteside, division administrator of NRA had made the following statements:

(1) That Nema was derelict in not securing NRA support for more strict code compliance.

(2) That he strongly advised that the radio industry secure a radio code of its own and as quickly as possible.

(3) That Mr. Whiteside stated "By all means the radio industry should have its own code and quickly. You are only a stepchild of the electrical industry and will be treated as such; they will rock you right and left eventually if not now, in the sale of their products which compete with yours, in merchandising restrictions, in your Association relations and in expense of administering their Code. By all means I advise your industry to secure a code of its own and as quickly as possible."

Copies of these letters, having reached the attention of Nema's Board of Governors, the matter was brought to the attention of Mr. Whiteside who absolutely denied that the statements quoted therein were true.

Meanwhile the RMA has promoted a "BUY RMA" campaign in its own organization, as indicated by its circular letter to all RMA members, dated Jan. 12, 1934, reading as follows:

"That all of our manufacturers 'BUY RMA' is the suggestion which has come from several RMA directors and members. The plan was approved January 11 unanimously by the RMA Board of Directors. To solidify the radio industry, keep the interest of allied lines supplying parts, accessories and raw materials, and increase Association membership, it is proposed that where everything is equal RMA members should deal with each other in buying parts or raw materials. You are requested by the RMA Board of Directors to actively assist."

(1) By directing your purchasing department to urge or require all concerns from whom you buy parts, accessories or raw materials to join the RMA and

(2) By directing your purchasing department to buy all parts, accessories and raw materials from RMA members whenever possible, and

(3) By directing your purchasing department to give preference to RMA members when and if all other things are equal.

"Another suggestion is that a sign be placed in your purchasing department declaring that 'We are members of the RMA and are obligated to purchase our parts, accessories and other supplies from RMA members when and if all things are equal.'

"It is felt by the RMA Board of Directors that the above requests for your action through your purchasing department are reasonable and would contribute to your company's interest as well as those of the industry. Parts, accessory and raw material concerns from whom you purchase make a profit from your company and live on the industry. It seems only fair and in the interests of all our members that all who profit from the industry should 'do their share' toward supporting it, by membership in the Association. The cost of such membership is small and your action by instructing your purchasing department as outlined above would be appreciated and help all radio interests."

"Buy RMA."

"RADIO MANUFACTURERS ASSOCIATION
W. S. Symington, Chairman, RMA
Members Committee.
Bond Geddes, Executive Vice President and General Manager."

Implies RMA Activity Resembles a Racket

I might say, Mr. Administrator, that that recalls to mind years ago how certain retail grocery groups used to require manufacturers of grocery products to come through and keep your State grocery associations in existence.

The Code Advisory Committee of our Code Authority made formal objection to this campaign, addressing a letter dated January 29th to Messrs. A. T. Murray and Leslie F. Muter, Supervisory Agencies appointed by our Code Authority, stating therein that they did not approve of the issuing of this RMA general letter of January 12th quoted above; that in their opinion its issuance was very unwise; and that the letter apparently advocates activity, directly opposed to two of the objects of the National Industrial Recovery Act,—namely, the building up of monopolies, and the oppression of small manufacturers.

5. Trade Practices.

Mr. Bond Geddes refers in his letter of June 27th to "the few trade practices of the approved electrical code."

The electrical manufacturing industry code approved on Aug. 4, 1933, contains three trade practices articles, namely Articles VIII, IX and X, dealing with uniform accounting and costing, selling below cost and published prices. The code also provides under Article XIV for the presentation of supplemental codes applicable to one or more branches or subdivisions or product classifications of the electrical manufacturing industry. The electrical manufacturing industry code thus made specific provision by which the special problems of any product classification, such as receiving sets for home use, could be presented and approved.

Proposed amendments to Article 12 of the electrical manufacturing industry code cover trade practice problems, as follows:

(a) Misleading Advertising.

Self-Government in Business?

That the theory of "self-government" has very definite limitations in the practical working out of the NRA law shows up in the testimony reported in this and the last issue of the NEWS. It is important to note that the law makes no provision for hearings of this nature. At the beginning of the hearing (as reported on page 10 of the Aug. 8 issue), E. P. Delaney, representing the NRA Legal Advisory Board, stated (italics ours):

"These public hearings are not *judicial investigations*, nor really are they *legislative investigations*, but really more in the nature of administrative inquiries whereby the facts may be presented at these public hearings, in order that the *Administrator may*, upon the basis of those facts, *reach a determination*.

"It must be borne in mind that the hearing is conducted under the direction *solely* of the Deputy Administrator in charge of the hearing, that all persons representing interests here shall consider themselves as *witnesses*, and that they will be questioned by the Administrator and *by him alone* unless he determines otherwise.

"The purpose and object of the Administrator is to give every one an opportunity to be heard, either as proponents or as opposing interests.

"There is no objection to proponents or others being represented by specialists or attorneys. At the same time, they must consider themselves as *witnesses*, and not as counsel conducting a lawsuit."

(b) False Statements Regarding Policies of Competitors.

(c) Inducing Breach of Contract.

(d) Fraud and Misrepresentation as to Quality and Size.

(e) Threats of Suit for Patent or Trade Mark Infringement.

(f) Secret Rebates.

(g) Consigned Stock.

(h) Splitting Commissions.

(i) Extension Warranties.

(j) False Records.

(k) Commercial Bribery.

(l) Giving of Prizes, Premiums or Gifts.

(m) Selling Without Profit to Induce Sales of Other Products.

(n) Espionage of Competitors.

These proposed amendments include provisions of a general nature which have been found, after scrutiny and careful criticism by the electrical manufacturing industry, to be of common value to all product classifications. They are not intended to meet the specific problems of each section of the electrical manufacturing industry. Such specific problems of trade practices may, however, be taken care of through supplemental codes for product classification. They are being and can be covered by supplemental codes two of which have been signed and 40 of which are in various stages of preparation.

So-called radio manufacturers, under the electrical manufacturing industry code, can meet their own special and peculiar needs just as many of the divisions of the electrical manufacturing industry have done or are doing.

Coordination of such a supplemental code or codes with similar codes for radio wholesaling and jobbing can also be provided for in a supplemental code under the electrical manufacturing industry code.

At this point, Mr. Administrator, it seems proper that Judge Neagle should comment on the revised letter of presentation which RMA has made, if he may at this time.

Deputy Cowling: Judge Neagle?

Neagle's Statement

Statement of Francis E. Neagle On Behalf of the National Electrical Manufacturers Association

Mr. Neagle: I should like, Mr. Deputy Administrator, to comment upon certain statements that appeared in the statement that was read by Captain Sparks.

The first statement is that the annual sales volume, retail volume, of the industry's products in 1933 was over \$200,000,000. This is the first time that I know of in connection with code preparation or a request for exemption that NRA in dealing with the manufacturer has dealt with retail volume. All statistics in connection with codes that I have ever seen have been statistics of the manufacturers' volume.

As Mr. Donald has read, these statistics for the radio industry show for the year ending Dec. 30, 1933, approximately \$63,000,000. Because in the statement Mr. Donald read there was omitted by inadvertence an item of \$546,000 for commercial receiving sets, it would make the total something like \$63,000,000.

The actual sales of the industry from the manufacturers' standpoint are shown by the reports of the Bureau of Internal Revenue for the period ending June 30, 1933. In Captain Sparks' statement it was pointed out that about \$2,250,000 has been paid by the radio industry in excise taxes during the past few years of operation of the law.

Now, as the tax is 5 per cent, if you multiply \$2,250,000 by 20, you reach a figure of \$45,000,000. Taking the statement at its face value, that would indicate a production of radio receiving over the last few years of \$45,000,000. Our figures show radio receiving sets for the year ended June 30, 1933, approximately \$5,000,000, which checks with the figure of \$2,250,000 paid in excise taxes.

There is nothing secret about that figure. We have the figures, not the amounts paid by individual manufacturers, but the total amount paid under that clause

incandescent lamp manufacturers, or any other branch of the industry. The protests of the incandescent lamp manufacturers, as the Deputy Administrator well knows, have nothing to do with the code for the Electrical Manufacturing industry; they had to do with a patent situation which the code has nothing to do with, and the application of the independent incandescent lamp manufacturers was denied by NRA. They made protest but their protest was thrown out.

Then again:

"Also from Congress, the Consumers' Advisory Board, the Darrow Committee, other Federal sources, the public, and even some members of the Electrical Industry itself has come many criticisms and complaints regarding operations and results of various features of the Electrical Manufacturing Code."

Darrow Committee Cleared Electrical Code

Now, so far as Congress is concerned, Senator Nye made some statements with regard to the incandescent lamp manufacturers in connection with the Electrical Manufacturing Code. Senator Nye did not know what he was talking about. It has no connection with the Electrical Manufacturing Code. It had to do with the patent situation in which one electrical manufacturer was concerned.

The Consumers' Advisory Board, so far as I know, has made no complaint with regard to the electrical manufacturing code except a statement made at a public hearing by one of its representatives with regard to some prices which he felt were too high.

Now, with regard to the Darrow Committee, the first complaint heard by the Darrow Committee was a complaint by the incandescent lamp manufacturers with regard to the Electrical Manufacturing Code. The Darrow Committee gave the electrical manufacturing code a complete and clean bill of health and said that under the electrical manufacturing code there had been no monopoly, there had been no oppression of small enterprises.

Again, the Darrow Committee considered some other complaints with regard to the Electrical Manufacturing Code, and in its second report it again cleared the Electrical Manufacturing Code of all complaints.

These facts are known to Mr. Geddes just as well as they are known to me, and they are known to the RMA just as well as they are known to me.

Then there is another example of the character of statements that have been made. With reference to statistics it says:

"While the Electrical Code (paragraph 6) requires that such statistics, data and information shall be kept confidential, it unquestionably requires submission to powerful competitors in another industry of information which is vital."

Nema Statistics Not Available to Governors

That is known to be a misstatement. The code expressly provides that those statistics can only be examined by an employee of the Code Authority. They are not available to any member of the industry, whether he is on the Board of Governors or the Executive Committee, or anyone else. Those statistics are and have been absolutely confidential. There is not a person on the Board of Governors of Nema who can see the individual figures of any member of the industry, whether a member of Nema or outside.

Reference is made to the severe, improper and artificial limitation on the radio industry through the administration of Article VII of the Electrical Code. Article VII, that any employer may participate in any endeavor of Nema, the preparation of any revisions or of additions or supplements to this code by accepting the proper pro rata share of the cost and responsibility of creating and administering it, either by becoming a member of Nema or by paying to it an amount equal to the dues from time to time approved to be paid by a member in like situation of Nema.

The statement was made that there was no objection to the proposed exclusion of the radio industry from the electrical manufacturing code. That statement is correct. The proposed radio code, to the best of my recollection, never came up for public hearing. Had it come up for public hearing and a definition for the radio industry been proposed which was similar to the definition proposed in the code which has been submitted to you, Nema would have objected to it.

Says RMA Should Be Ashamed of Itself'

Then, under the heading of "Results of Electrical Manufacturing Code," we think that RMA should be utterly and completely ashamed of itself for making the statements that are contained under the heading. It states:

"We respectfully submit that in many

respects the Electrical Manufacturing Code is unsatisfactory

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Commercial Refrigeration at Fair Gives Trouble-Free Service, But Systems Are Fewer This Year

(Concluded from Page 1, Column 3)
most of them are now in receivership. These too are reverting to ice.

Just about two weeks ago the Fair management rescinded its restriction against liquor patrons standing up to the bar to drink. This was done at the request of concessionaires who claimed that many people were buying drinks outside the Fair, and pointed out that the average expenditure per person had dropped to about half of the 1933 figure.

That the service given by commercial machines has been very satisfactory was the opinion of each user which your reporter visited. Most of the restaurant managers were too busy to give further testimony on the operation of their equipment, but as a rule they were quite willing to let one "look around."

Must Guard Against Sand

Machines were usually installed in some remote location, out of sight of the general public. The installations generally appeared to be made in accordance with the A.S.A. standard code for mechanical refrigeration, in spite of the fact that the Fair grounds are on Illinois state property rather than Chicago city property, and it might be expected that some liberties might have been taken because of the temporary nature of the installations.

Principal precaution which must be taken on installations at the Fair is against sand getting into mechanisms of condensing units. Naturally, there is a lot of sand along Chicago's lake front, and sometimes a stiff breeze will distribute it pretty thoroughly along the grounds.

Services 317 Systems

So George Monjian, president of the Chicago Refrigeration Service Co., has his men make weekly inspections of each one of the 317 commercial systems which he has contracted to maintain on the grounds. This is not the total number of commercial installations at the Fair, of course, as several refrigeration manufacturers, particularly those building heavy equipment, did their own installing and provide their own maintenance service.

These service men go into the grounds about midnight with a service truck and proceed from one job to the next, systematically cleaning air-cooled condensers, inspecting the controls, oiling motors, and seeing that nothing has been placed in the path of air flow of air-cooled condensers.

Keeping condensers free of sand and dust, and instructing the Fair employees not to store anything which would obstruct the cooling air of air-cooled condensers have been the chief problems—and these have not been difficult, according to Mr. Monjian. Not one complaint has been received about a motor trouble, he says. Nor has there been a single gas leak.

By five in the morning the service truck will have covered the territory, and all equipment under service contract will be inspected and adjusted for another week's operation.

Heavy Usage in Evenings

Asked about the severity of the load on the Fair's refrigeration equipment, Mr. Monjian said that it is really not as hard as in the ordinary restaurant which serves three meals a day and stays open until midnight.

On the Fair grounds, he points out, the heavy usage factor comes from 5 p. m. until midnight, which is only seven hours a day.

Up until two weeks after the Fair opened this spring, Mr. Monjian's company operated a service shop on the grounds because at that period quite a crew of men was necessary to do the pre-season installation work and to get the systems ready to start. Mr. Monjian himself had an apartment above the Victor Vienna Cafe.

All refrigerant lines were run through steel tubing by the Chicago Refrigeration Service Co. When the Fair closes, much of this material will be recovered for use in other installations.

One of the few refrigeration systems which are actually on public display is the 25-ton Vilter equipment used by Wilson & Co. to cool an 80 by 30-ft. triple-glass-enclosed room in which about 20 girls work in a typical bacon-slicing unit of that packing company.

The refrigeration system, which holds a 60° temperature and a relative humidity of 65 per cent so that the bacon will be preserved properly, operates inside a glass enclosure for visitors to view.

Of particular interest in this installation is the fact that it is the only one on the grounds which uses ammonia as a refrigerant. Ammonia was ruled out by the Fair management, and special permission had to be secured to use it in this Wilson

installation. The equipment room is kept under vacuum by an exhaust fan which would remove any escaping ammonia.

The equipment includes a two-cylinder vertical ammonia compressor, a shell-and-tube water-cooled condenser, a flooded shell-and-tube brine cooler, and both water and brine pumps. The water pump is set to start at 45 lbs. pressure and build up to 80 lbs., operating mainly as a safety apparatus in case the Fair's water pressure falls too low.

The brine pump drives brine to fin-type coils in the center of the ceiling in the bacon-slicing room where a unit cooler, concealed in a lighting fixture cools the air and discharges it into the room. Most of the air is recirculated, but sufficient outside air is introduced to keep it fresh inside.

A Penn thermostatic control keeps the brine temperature between 9 and 14° F., and various safety devices are installed to prevent accidents.

Skating Rink

Another outstanding installation is the skating rink at the Black Forest, a German village. This equipment, a carbon dioxide system serving to produce ice for skating and also to air condition two restaurants, was installed by Wittenmeier Machinery Co.

Since this installation was described with some detail in the report of air conditioning at the Fair in the June 6 issue of ELECTRIC REFRIGERATION NEWS, it will not be treated further here.

For the manufacture of Coca-Cola in the model Coca-Cola plant in the Agricultural building, Westerlin & Campbell Co., York agents in Chicago, have installed a 25-ton Freon system with two stainless steel Baudelot coolers to refrigerate water for the Coca-Cola process.

Servel-Cooled Display Cases

Wilson displays meats in the Agricultural building in 10 display cases, each refrigerated by a model 500 (5-hp.) Servel air-cooled condensing unit. Libby, McNeil & Libby also has seven Servel-cooled display cases in the Agricultural building.

Wittenmeier has several methyl chloride machines (of Universal Cooler manufacture) at the Fair. Largest of these is a 5-hp. machine in the Hawaiian Village, which also has a 1/2-hp. compressor, both on restaurant service.

Other Wittenmeier-Universal methyl chloride machines are at Old Heidelberg Inn (three 3-hp. units), and at the Black Forest where a 1-hp., a 2-hp., and a 3-hp. compressor refrigerates beer boxes, a walk-in cooler, a vegetable room, and short-order boxes.

Freeze Storage Batteries

Down in the Chrysler building is an unusual demonstration which seems to catch the public eye. Willard Battery freezes up storage battery in a block of water ice with a small York ice-making system, removes the cake of ice, breaks it up, and uses the electrical power in the frozen storage battery to lift an automobile.

In the Ford building nearby is another interesting installation of refrigeration equipment. Here R. Cooper Jr. has furnished 14 General Electric pressure-type drinking water coolers of the self-contained type (model PB-3).

Where the usage factor is so high (from almost continuous use) that the refrigerating system in the base of the water cooler is unable to handle it, a pre-cooler tank has been installed to reduce the water temperature from about 75 to 55° F. Cooper has five of these pre-coolers in the Ford building.

Swift Ice Cream

Selling Swift's newly introduced ice cream at about 80 stations throughout the Fair grounds are Frigidaire ice cream cabinets, all of the remote type. Swift & Co. took over Chicago's Collins Ice Cream Co. a few months ago and is now selling its own ice cream.

Schlitz' Beer Garden on the island has an installation of two four-cylinder Ice-O-Matic condensing units cooling water coolers, a beer-serving fixture, and a forced convection blower unit in a walk-in refrigerator.

Forced convection cooling of a walk-in refrigerator is also employed at the Italian Village where a 2-hp. G-E condensing unit is connected to two type EC9 G-E "Conditioned Air" chilling units for pre-cooling beer. The Italian Village has a 1 1/2-hp. York Freon machine serving two walk-in coolers and a short-order box in the kitchen of the Italian restaurant.

Still another application of unit coolers for product cooling is the Kelvinator installation at the Swiss Village where Swiss cheese is on display in a room kept at 65° F. Con-

densing equipment includes a 3-hp. four-cylinder Kelvinator unit.

Scattered around the grounds are 60 or 70 Swift's hamburger stands where you can get a fresh sandwich and a drink. Each of these has a Frigidaire or Servel condensing unit serving refrigeration to a special 2x2x6-ft. short-order box and a water cooler.

On restaurant service at the Irish Village are eight G-E service cabinets, four 60-ft., three 27-ft., and one 18-ft. refrigerators. The Malibu Beach Club also has a large 60-ft. G-E service cabinet.

Toy Town Tavern

Toy Town Tavern, a children's restaurant on the Enchanted Island, has three Frigidaire ice cream cabinets and two Frigidaire-equipped soda fountains; ice cream cabinets are 1/2-hp. units, the soda fountains are 1-hp. units. This concession also has a 1/2-hp. Servel machine for its water coolers and delicatessen service.

A 9 by 7-ft. beer tunnel in the Victor Vienna Cafe is 102 ft. long. This is refrigerated by a Larkin "Hum-Temp" forced convection unit and two four-cylinder Ice-O-Matic condensing units. Also in the same system are six draft beer serving stations (the tunnel acts as the pre-cooler), a walk-in refrigerator, and three 22-ft. service cabinets.

Victor Vienna's cafeteria has two Frigidaire ice cream cabinets, and a salad pan cooled by a 1/2-hp. Kelvinator.

Seven of Swift's Century Grills, where incidentally you can get a very good meal for a moderate price, have a combination meat refrigerator and beer keg pre-cooler, a short order box, and two water coolers. These have Carrier 1 1/2- or 2-hp. condensing units, depending on the size of the restaurant.

The two Century Grills on the 23rd St. Bridge have two short order cabinets in the kitchen upstairs, two water coolers, and walk-in boxes, all

served by a Carrier machine. These two also have Frigidaire ice cream cabinets.

Using methyl chloride as refrigerant, a Vilter 7 1/2-ton reciprocating compressor driven by a 10-hp. motor provides refrigeration for two beer keg pre-coolers, a vegetable box, a meat box, two short order boxes in the kitchen, a beer station in the kitchen, and two beer stations in the restaurant proper of Old Heidelberg Inn.

The restaurant in the Mexican Village has a Kulair 1 1/2-hp. condensing unit furnishing refrigeration for a short order box, a walk-in refrigerator for meat and beer kegs, and a water cooler. This concession also has two Frigidaire ice cream cabinets.

Chilling Tomato Juice

H. J. Heinz' exhibit has a refrigerating set-up for chilling tomato juice which embraces a 1/2-hp. General Electric condensing unit operating with a service cabinet cooled by fin-type coils.

Some half-dozen Kosher sandwich stands on the Fair grounds each have a short-order or grocers' refrigerator, cooled by a Servel air-cooled condensing unit.

Installed by Kroeschell Engineering Co. of Chicago in the English Village is a 2-hp. Universal Cooler methyl chloride condensing unit operating a combination meat storage and beer storage cooler.

To preserve ingredients for making salad dressing, Servel's Chicago branch has installed a 1/2-hp. methyl chloride machine for the exhibit of Durkee's Food Products Co. Servel also has equipment for cooling citrus fruit and grape juices in the Florida State exhibit, and a system for preserving frozen fruits in the display cases in the Oregon State exhibit.

In Armour's building on the 16th St. Bridge, York Ice Machinery has installed a 5-hp. Freon machine for a dry beef packing demonstration, a

1/2-hp. machine for a display case, and a 1/2-hp. machine to cool a walk-in refrigerator.

Coca-Cola and frozen custard stands, of which there were 27 and 9, respectively last year, no longer grace the list of electric refrigeration users.

The Coca-Cola stands are using ice this year, having removed their Kelvinator equipment last fall when plans for the 1934 Fair were so tentative, and the frozen custard stands (which had Universal Cooler machines) have apparently left the Fair completely.

Milk-Serving Stands

Borden's 10 or 11 milk-serving stands on the grounds have Frigidaire equipment. These milk coolers are of the ice cream cabinet type, and cool both sweet and chocolate milk. They are supplied with milk from a Frigidaire-cooled motor truck which distributes the milk at night.

The Spanish Village uses a 1 1/2-hp. Williams Ice-O-Matic machine to refrigerate three walk-in coolers with blower-type cooling units, a vegetable cabinet, a meat case, and a short order box.

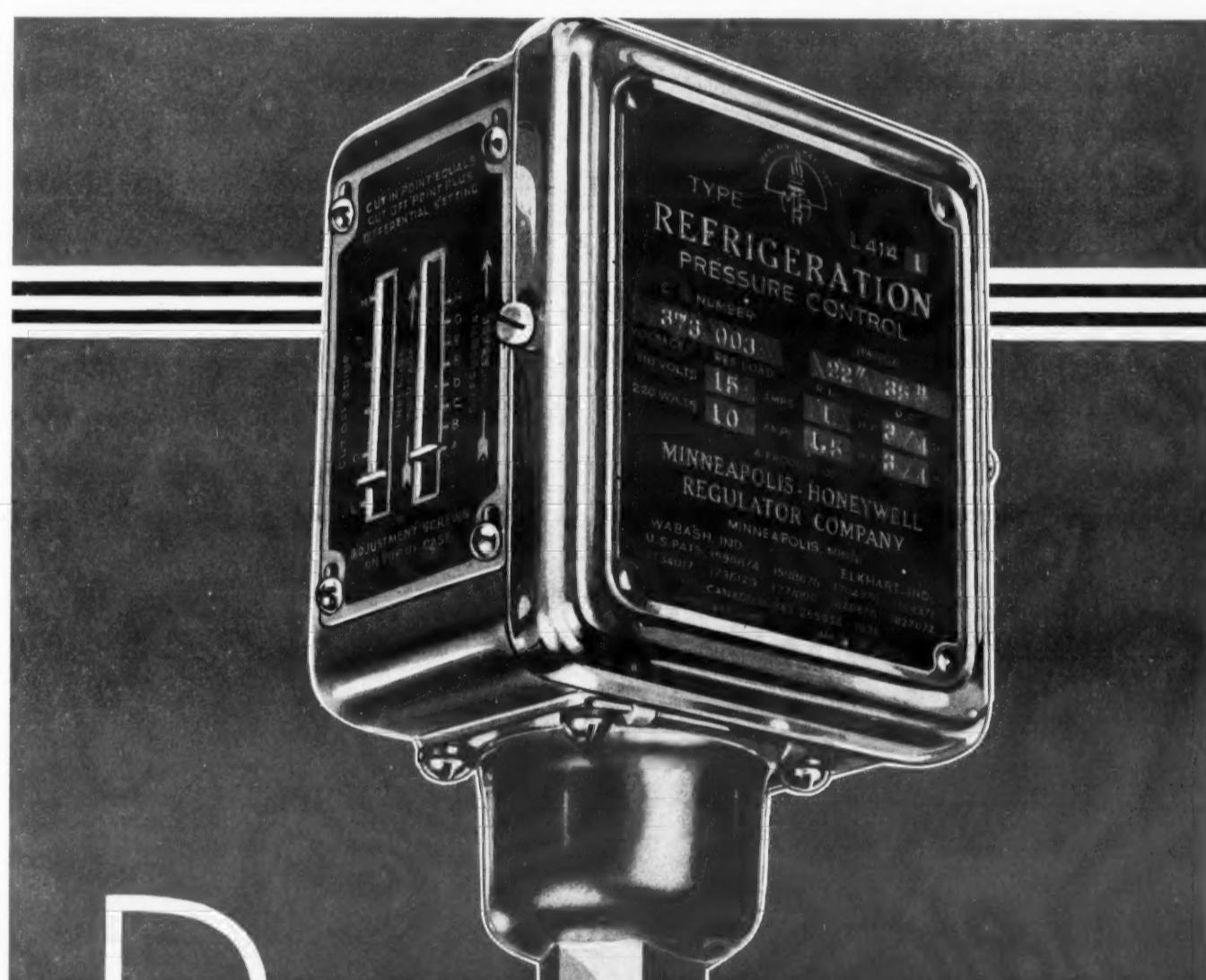
On restaurant service is a 1-hp. Servel machine in each of the following establishments: the Czecho-Slovakian Village, the Triangle restaurant, Edward's Ranch, and the Mayflower restaurant.

Two Triangle restaurants each have a 2-hp. Frigidaire machine cooling three water coolers, a salad pan, a short order box, and two walk-in coolers.

Three York installations operate in the Horticultural building. One is a 1 1/2-hp. machine refrigerating a beer storage and a kitchen refrigerator.

The other two are 2-hp. Freon machines connected to glass-front floral display cabinets.

In the Shanghai Village are two Frigidaire-equipped soda fountains, water coolers, salad pans, and an ice cream cabinet. These are both standard Hydrex ice cream jobs.



REFRIGERATION IS ONLY AS GOOD AS ITS CONTROL

PROPER automatic control is necessary for efficient operation of refrigerating equipment. To insure long, trouble-free performance, specify Minneapolis-Honeywell refrigeration controls. Visible scales, locking and leveling devices, wide range, accuracy, small or large operating differential — all at no extra cost —

simplify installation and service... Minneapolis-Honeywell Refrigeration Controls are available in all desired temperature and pressure ranges, and are suitable for all types of commercial installations or air conditioning applications... Minneapolis-Honeywell Regulator Co., 2807 Fourth Avenue South, Minneapolis, Minnesota.

MINNEAPOLIS-HONEYWELL

Control Systems

Van Allen Objects to Harsh Words of Neagle

(Continued from Page 16, Column 5) talking about something that does not exist.

Mr. Neagle: A proposed code.

Deputy Cowling: A proposed code.

Mr. Neagle: A proposed code exists, a copy of which was furnished to us by RMA, and when a statement of that kind is made I think it is quite proper to look at their definition because it shows that the complaint is entirely groundless because they have elected to define processing employees in exactly the words that are in the electrical manufacturing code.

Deputy Cowling: All right, proceed, then, Judge.

Mr. Neagle: The statement is made that under the approved electrical code, the proposed amendments and revisions, no provision is made for participation or representation by radio manufacturers on any industrial relations and policies tribunal which may be established to deal with rights and privileges of employees as well as employers in the radio industry.

No reference is there made to motor and generator manufacturers, or to turbine manufacturers, or to wire manufacturers, or to any other manufacturers. The idea is that the electrical manufacturing industry is an industry, and that any committee of any kind selected under the code shall be a committee representative of the electrical industry. It would be just as much representative of radio as anything else.

If at any time a committee were appointed and there had to be placed on it representatives of each branch of the electrical industry, then every meeting of the committee would be a New England town meeting.

Now, with regard to trade practices, reference is made to the few trade practices of the approved electrical code.

Radio manufacturers were not consulted and have had no voice in the additional trade practices submitted to the NRA by the electrical code authority.

Every known member of the radio manufacturing industry received an invitation to be present at the meeting where those proposed trade practices were considered and had a right to come there and had a right to take part in the negotiations, but they did not do it, as is stated, because so to do rendered them liable to pay part of the costs of administering the code for the electrical manufacturing industry.

They asked again that they must have different trade practices. Let me again refer to their proposed code, and in their proposed code they have six or seven proposed trade practice provisions taken practically word for word from the additional trade practice provisions proposed in the amendments to the electrical manufacturing code. That does not look as though they needed different trade practice provisions, but they copy the provisions that are proposed in the amendments to the electrical manufacturing code.

The statement is made that the RMA board of directors has formally agreed to pay to Nema a fair and equitable amount of the cost of radio manufacturers while operating under the electrical code. That is, fair and equitable in the opinion of the RMA.

Mr. Van Allen: That is not said, Mr. Neagle. That is not said in that letter. That is not a fair inference or a fair statement.

Mr. Neagle: I beg your pardon?

Van Allen Says Nema Attorney Is Unfair

Mr. Van Allen: That is not a fair inference or a fair statement. He did not say, "In the judgment of the RMA."

Mr. Neagle: I am stating that.

Mr. Van Allen: Perhaps you are stating it in the opinion of Nema, but let us be fair in the proposition.

Mr. Neagle: Mr. Deputy Administrator, in the brief is that it formerly agreed to pay a fair and equitable amount. The amount which they stated they would pay was \$25,000. I repeat that the fair and equitable amount was an amount considered fair and equitable by RMA and not by Nema.

The statement is made that today the RMA has not assessed any member one cent for operation under the electrical code, but all code expenses, including current expenses of the respective code supervisory agencies for radio and television receiving sets and radio parts and accessories, have been borne by the association.

It then states:

"However, a large assessment has been made by Nema upon a group of radio tube manufacturers."

Nema Members Are Not Assessed, But Pay Dues

That statement is unqualifiedly false. Nema has made no assessment upon anybody for code operations. Nema has dues under its constitution and by laws which are paid by its members, and anyone who joins Nema is bound to pay the dues fixed, but Nema has not assessed or attempted to assess any person in the electrical industry outside of its members.

Certain electrical manufacturers who are not members of Nema have voluntarily contributed to the expense of code administration, but Nema has levied no assessment for code administration on anyone. The entire cost of administering the electrical manufacturers code has been borne by Nema out of dues paid to it by its members.

The statement is made that the code authority of the electrical industry is not cognizant of or interested in the problems of radio manufacturers. As a matter of fact, at least 60 per cent of all the things that go into radio sets other than cabinets are manufactured by Nema. All that the RMA is, in effect, is an organization of assemblers of electrical products. There is not a single part in a set, so I am told, which is not an electrical product.

Now, the statement is made:

"Furthermore, radio manufacturers have no representation or voice on the Electrical Code Authority."

Of course they have not. They have elected not to cooperate in the admini-

stration of the code. They have elected to stand on the outside and not pay.

Mr. Van Allen: Just a minute; we offered to pay.

Mr. Neagle: Would you mind not interrupting me?

Mr. Van Allen: All right, but I don't like to sit here.

Deputy Cowling: You will have a right to speak.

Mr. Van Allen: All right.

Mr. Neagle: The statement is made:

"We originated from the invention of distinct devices not theretofore used in any other industry."

Neagle Contradicts RMA Statements

That statement, I think the technical people can absolutely tear down.

"The RMA originated with the industry and has continued from the beginning as sponsor and spokesman for it."

My recollection is that the radio section of the Associated Manufacturers of Electrical Supplies was in existence some years before the RMA was.

The statement is made:

"Its sources of distribution are not by any means confined to those distributing electrical products, but to the music trade, exclusive distributors and the dealers of radio, hardware merchants, department stores, automobile parts and accessories, and many others."

Apart from music stores, which I do not think sell generally the products of the electrical industry, every one of the sources of distribution that they refer to are common, ordinary sources of distribution for the electrical industry and have been for years.

The statement is again repeated that they have no representation, nor do they have any voice "in our own destination, or vote in connection with code matters or administration."

That, Mr. Deputy Administrator, is solely by force of their own desires. Had they joined in the operation and administration of the code, as many other manufacturers have done, they would have had the same representation that every other manufacturer in the industry has had.

The statement was made, "By domination of a large and powerful group."

Of course, the operations of Nema are carried on by their Board of Governors, which consists of 30 members, 23 of whom are either small or medium sized manufacturers.

The difficulty here, Mr. Administrator, is not with the Electrical Manufacturing Code at all, but is with the desire of RMA to get out from under the proposed amendments to the code because those proposed amendments, in so far as paying the cost of operation is concerned, are quite different. The proposed amendments to the electrical manufacturing code say that every employer in the industry shall pay his proper pro rata share of the reasonable cost of administering this code. It will not be a question of participation in amendments or revisions or supplemental codes, but will be a question of paying the proper share of the cost of code administration whether a member of Nema or not.

(The definition of the Radio Industry herein referred to is as follows:)

The term "Radio industry" as used herein shall include the manufacture for sale of

(a) Radio and Television Receiving Sets.

(b) Radio and Television tubes, Electronic Tubes and Valves.

(c) Parts, cabinets and accessories for radio and television receiving sets, including all component parts thereof, and also equipment for the distribution of sound, originating from such receiving sets or an electric phonograph.

There may be excluded such items as in the opinion of the NRA have such other uses than radio as to make it advisable after hearing to retain them in their present code or other codes.

(Upon the expiration of the recess the hearing was resumed.)

Deputy Cowling: The public hearing is now reconvened.

I am going to ask Judge Delaney to make a statement, if he will.

Delaney's Second Statement

Further Statement of Mr. E. P. Delaney of the Legal Division of NRA

Mr. Delaney: The Administrator has requested me to make a further amplifying statement in connection with what I said this morning.

In respect to controversial matters, particularly with reference to the code as proposed, there is no desire on the part of the Administrator to limit the testimony here.

At the same time, it seems advisable that the testimony, as presented be confined chiefly to the question as to the merits in respect to the exemption as asked for by the RMA, and that matters in connection with the proposed code be not discussed, either labor provisions or otherwise, except in so far as they may be related to the exemption as has been requested by this division.

I will admit it is rather difficult to draw a line, yet that is going to be the attempt of the Administrator, to draw a line so as to limit this record or this hearing and not extend them any further than is necessary.

So, if you will attempt to confine yourself to the pertinent points at issue, as to the matters relating chiefly to the exemption and not to matters outside the record, it will facilitate matters.

I also want to caution both the proponents and the opponents to the effect that this is not a hearing where arguments may take place, but that each side may have an opportunity to present all their facts in connection with their proposition, but this is no place for personalities or other arguments.

Deputy Cowling: Mr. Donald, do you wish to finish your statement?

Objections of Fixed Capacitor Section of Nema

Statement of Mr. W. J. Donald (Resumed)

Mr. Donald: In order to facilitate matters, and to take as little time as possible, I will try to eliminate such parts of the rest of this brief that are in repetition of what has been said with respect to other sections.

Deputy Cowling: That will be very helpful if we can do that.

Mr. Donald: The rest of this brief, all except the summary, pertains to the effect of the requested exemption on 15 sections of the Electrical Manufacturing Industry and sections of Nema. The facts and objections with respect to each of these sections are presented in separate sections. In each case there is briefly presented the products classified under those sections which are or may be involved.

So that I will eliminate the first few paragraphs, unless you would like to have me define the products specified at this time.

Deputy Cowling: I take it that it would be well to define the products.

Mr. Donald: There are certain paragraphs that are repeated each time as an introduction, and we can eliminate those.

First is the Dry Batteries and Flashlights Section.

The Dry Batteries and Flashlights Section of the Electrical Manufacturing Industry and of Nema embraces the following products:

(a) Six Inch Dry Cells.

(b) B Batteries.

(c) C Batteries.

The facts and the objections of the Dry Batteries and Flashlights Section of the electrical manufacturing industry and of Nema to exemption of the so-called radio manufacturing industry from the operations of the electrical manufacturing industry code are as follows:

(a) All of those products are used without modification for purposes and in applications other than and entirely different from radio, such as fire alarm systems, telegraph systems, signalling apparatus, and in connection with electrical instruments.

(b) Only a very small part of the sales volume of the products specified above are used for radio purposes.

(c) A very large proportion of the sales volume of the products specified above are manufactured by members of the Dry Batteries and Flashlights Section of Nema—well in excess of 75 per cent.

(d) This section of the electrical manufacturing industry has prepared a supplementary code for presentation to NRA under the electrical manufacturing industry code.

(e) This section of the industry is filing its prices under the provisions of Article X of the Electrical Manufacturing Industry code.

(f) This section of the electrical manufacturing industry points out that embarrassing difficulties would arise, not only to the industry but also to NRA if manufacturers were forced to do business under two codes for the same product.

(g) It would be entirely unsound to require manufacturers of these products to be subject to any code other than the electrical manufacturing industry code, not only because they are properly organized in Nema and under the electrical manufacturing industry code to function in respect to the Dry Batteries and

Flashlights Manufacturing Industry problems, but also for administration of the Electrical Manufacturing Industry Code. It would be utterly unsound to have these products under the Electrical Manufacturing Industry Code when sold for most purposes and a small part under another code when they find their way into use in a special application, such as radio. Indeed, when they leave the manufacturer's factory the manufacturer has no knowledge as to the use to which they must be put. Whereas B and C Batteries originated for radio use they are now used for several other purposes.

(h) This section of the electrical manufacturing industry strongly objects to regulation of the operations of manufacture and sale of these products by a code authority primarily representative of manufacturers of radio and television receiving sets for home use, especially as such complete set manufacturers are customers of the manufacturers of dry cells and batteries.

Deputy Cowling: Are the objections all about the same?

Mr. Donald: On most of them the basic principles are the same, and that is fairly illustrative. We can add one or two at the end.

Judge Neagle, is that satisfactory to you?

Mr. Neagle: I think that in certain cases the percentages and the application of the products vary; that is, in certain of these sections, only 1 per cent, for instance, of their products are used in radio, and 99 per cent in other electrical purposes.

Deputy Cowling: The introduction of this is entirely up to you.

You may do that, but I did want to save time.

Mr. Neagle: In this next one, for instance, electrical measuring instruments, only 1 per cent of the electrical measuring instruments is used for radio purposes.

Deputy Cowling: The introduction of this is entirely up to you.

You may do that, but I did want to save time.

Mr. Neagle: In this next one, for instance, electrical measuring instruments, only 1 per cent of the electrical measuring instruments is used for radio purposes.

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You may do that, but I did want to save time.

Mr. Neagle: In this next one, for instance, electrical measuring instruments, only 1 per cent of the electrical measuring instruments is used for radio purposes.

Deputy Cowling: The introduction of this is entirely up to you.

SERVICE

Service Operations Described For U. S. Hermetic

Uses SO-2 in a Direct-Driven One-Cylinder Compressor, With a High-Side Float, Ranco Controls & Rex Cabinets

THE U. S. Hermetic refrigerator, introduced to the trade at the radio show in the spring of 1932 in Chicago and manufactured by the United States Radio & Television Corp. of Marion, Ind., until that company merged with the Grunow Corp. of Chicago to form the present General Household Utilities Corp., was a one-cylinder hermetic refrigerator using sulphur dioxide as a refrigerant. Since the merger, production of the refrigerator has been dormant.

Tom Whitehead and Harold Greenwald of Detroit were co-inventors of the machine, and directed its production and distribution at Marion.

It was sold principally by large-scale merchandising organizations such as Marshall Field's department store in Chicago. Service and replacement parts are available by addressing the General Housing Utilities Corp., Marion, Ind.

Four, five, and six-cubic foot refrigerators were built, with both porcelain or lacquer exterior finishes. These were refrigerated by a condensing unit rated at 110 lbs. of ice melting effect per 24 hours, in an 80° room and a 20° F. evaporator temperature.

Direct-Driven Compressor

The compressor is direct-driven at a speed of 1,740 r.p.m. by a $\frac{1}{4}$ -hp. Delco built-in capacitor motor. Bore and stroke of the compressor are 1 1/32 by $\frac{3}{4}$ in. Rex cabinets, corrugated paper cell insulation, Ranco controls, a high side float control, and porcelain-on-steel evaporators feature the U. S. Hermetic.

Sulphur dioxide charges in the three refrigerators are 2.7, 3.3, and 3.6 lbs., respectively. All models should be provided with 900 c.c. of mineral oil lubrication.

Condensing unit is installed in the top of the cabinet, and was trademarked the "Roto-Pulse." It is provided with baffles to prevent warm air from recirculating in the machine compartment and causing inefficient operation.

Operation of Float Valve

The float valve, appearing behind the fan in Fig. 1, is a small valve actuated by a float. When the liquefied refrigerant in the finned tube condenser has collected in sufficient quantity, it raises the float ball, thereby metering refrigerant down into the cooling unit.

An electrical relay is provided with the system to direct the current through the starting winding of the compressor motor during starting, and after starting, to disconnect the starting winding so the machine will operate on the motor's main winding only.

The capacitor unit for the motor consists of an electrical condenser and a transformer. Its function is to assist in starting the motor, and improve its power factor and efficiency during the running period.

In placing the refrigerator in operation, care must be taken in mounting the thermostat in the opening in the upper front panel of the cabinet. To do this, turn the dial pointer to the No. 2 colder position. Insert a small screw driver through the open-

ing in the front of the cabinet, provided for the thermostat, and remove the screw in the center of the nameplate.

Lift off the nameplate, being careful not to touch any of the working parts inside the thermostat. Remove the screws provided for fastening the thermostat to the front of the cabinet in the same way.

Insert the front of the thermostat through the rectangular opening in the upper front panel, and fasten in place with the two brass screws provided. Before replacing the nameplate be sure the dial pointer is still at the No. 2 colder position.

After the nameplate is replaced and fastened with the center screw turn the dial pointer to the No. 1 position. The reason for turning the dial pointer to the No. 2 position is to make the center screw more accessible.

Service Reference to Past Issues

This article is one of a series published by Electric Refrigeration News to give the service man help in servicing various makes of machines. Most of the makes described to date have been "orphan" machines on which service data are now scarce.

Service instructions on the following makes were published in these issues:

Absopure household.....March 25, 1931
Majestic hermetic.....Aug. 16, 1933
Allison.....May 30 & June 6, 1934
Weisbach.....June 13, 20, & 27, 1934
Rice household.....July 4, 1934
Wayne household.....July 11, 1934
Absopure commercial.....July 18, 25, & Aug. 1, 1934
Iceberg.....Aug. 8, 1934

An operating diagram of the Belding-Hall Electric machine which used a gear pump, together with complete service instructions, will appear in the next issue of the News, Aug. 22.

The nameplate must be replaced with the pointer still at the No. 2 position, or the proper adjustment of the thermostat will be changed.

The next operation is to connect the automatic refrigerator light, in boxes which have this light, to the short leads extending from the rubber cord.

To do this, unscrew the small bakelite wire connectors from the ends of the two short leads. Connect these two wires to the two wires coming from the refrigerator light.

Heart of U. S. Hermetic

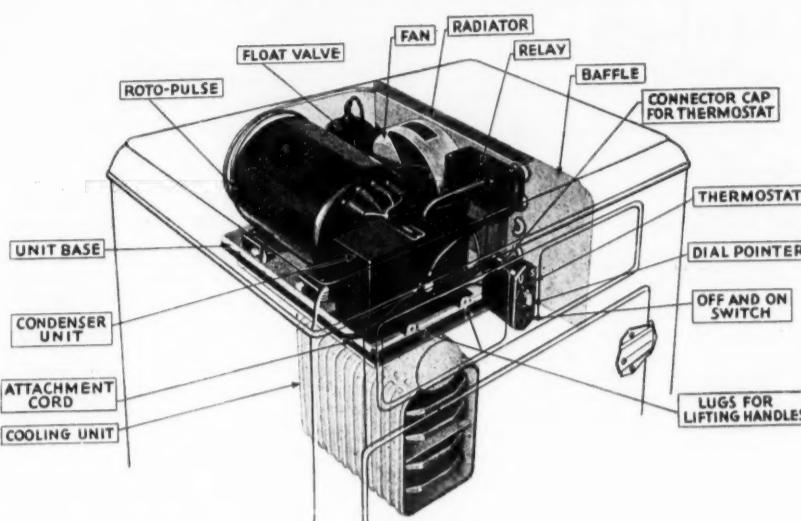


Fig. 1. Phantom view of the U. S. Hermetic refrigerating unit, for which service instructions are given in the accompanying article.

Then screw on the bakelite wire connectors which make a secure and insulated wire connection, eliminating the necessity of using solder or tape. Care should be used that no uninsulated wire is left exposed.

Make sure the sheet-steel baffle fits closely and does not have more than $\frac{1}{8}$ in. clearance from the radiator. The baffle should not touch the radiator in order to prevent possible noise.

The rubber attachment cord should be pulled through the opening provided at the back of the cabinet. Do not plug in the attachment cord until the refrigerator light has been connected and the thermostat installed, as explained above.

General Inspection

Before attempting any repairs or adjustments, it is desirable to obtain the history of operation of the refrigerator from the owner. Before coming to any conclusions, make a general inspection as follows:

1. Note that the switch on the front of the cabinet is turned on.

Note—If the switch lever is automatically thrown to the "Off" position, see article E. 1. Do not confuse the automatic throwing off of the switch with a defective switch, which will not catch in the "On" position.

When the automatic overload mechanism is functioning the switch lever will catch in the "On" position and will be thrown to the "Off" position within a few seconds to five minutes, depending upon the extent of overload. See explanation of "overload" below under "Adjustments."

2. See if unit is running or not running. If not running, find out whether unit has automatically cut out, before assuming anything to be wrong. If unit is off automatically, holding the hand on the thermostat bulb located on the right side of the cooling unit, will hasten the starting of the unit.

3. Be sure the electrical plug at baseboard is properly and securely inserted.

4. Determine that there is proper current available at the baseboard socket where the machine is connected. A voltmeter may be used for this purpose.

Note—The U. S. Hermetic is designed to operate on 110 volt, 60 cycle current, but will operate within a range of 90 to 145 volts.

5. Remove top from cabinet.

6. See that connector cap on thermostat is secure and making proper electrical contact.

7. Examine the four wire connections on the compressor. These are soldered connections and care should be exercised in inspecting them so as not to loosen them.

After examining the wire connections, attach a voltmeter to the first two of these connections, to determine the continuity of the circuit. If there is no voltage indicated at the compressor, there must be an open circuit at some point between the compressor and the rest of the circuit.

Note—Remove plug at baseboard while making the inspection to avoid shock, and reinsert the plug while using the voltmeter.

8. Note whether fan is running. Fan should run only when unit runs. The running of the fan indicates that current is available through the wiring up to that point.

9. See if the unit is installed in its proper position in the opening in the top of the cabinet. To check this, look inside food chamber to see if the porcelain unit base is flush with the porcelain lining of the food chamber.

10. See that the baffle in the machine compartment is properly installed. Its function is to prevent recirculation of air within the compartment.

Make sure that this sheet steel baffle fits closely and does not have more than an eighth of an inch clearance from the radiator. Also see that the baffle is not touching the radiator and causing a noise.

11. Examine the contact between

er handling a leak may occur. A small leak can usually be detected by the odor of the sulphur dioxide. If doubtful, wrap a small piece of cloth on a stick and dip in aqua ammonia about 28 per cent solution (ordinary household ammonia), and pass the cloth over the joints of the unit.

A leak can easily be detected by this method, because the sulphur dioxide combines with ammonia, forming a white smoke.

18. Check electric light by trying a new bulb. If this fails, examine wire connections. Note—If a general inspection fails to reveal the trouble make an examination as described below under "Service."

But before making any adjustments, read "The Adjustment of the Thermostat," on page 21. Before attempting to remove or change any parts of the unit, read "How to Change Electrical Parts," on page 21.

Service Problems

A.—Temperature of Cabinet Too Low

Having made a general inspection especially noting the contact between the thermostat bulb and the cooling unit to be good, inspect the thermostat connector cap. A short circuit in the wire connected to the thermostat would prevent the unit from being stopped by the operation of the thermostat.

If there is no short circuit at this point, adjust the thermostat to a warmer setting. (See, "The Adjustment of the Thermostat.")

The temperature in the food chamber should not be under 45° F. with the dial pointer in the No. 1 position. If this does not correct the trouble, change the thermostat.

B.—Unit Refrigerating but Cabinet Temperature Too High

1. Unit Cutting Out too Soon.

If the trouble is not determined by the general inspection, adjust the temperature control to a colder setting. Cabinet should not be over 50° F. with the dial pointer at No. 1 position.

C.—Cabinet Temperature Satisfactory But Unit Runs Too Much of Time

The temperature should not be below 45° F. with the dial pointer set in No. 1 position. If you are sure the temperature is not below 45° F., a general inspection will most probably reveal the trouble. In this case, only as a last resort should the unit be replaced.

Note—In handling a complaint of this sort considerable judgment should be used. A hot kitchen and warm food in the food chamber will cause the unit to run considerably, especially around meal time when it is likely to be noticed, while at night, the unit may be stopped most of the time.

Therefore, the running time can only be judged from the performance over a few days operation and the result depends a great deal on the amount of food put into and removed from the box, including water for the trays, and the number of times the door is opened, as well as the temperature of the room. Articles packed too tightly in the food chamber will retard the proper circulation of air.

Taking into consideration the

(Concluded on Page 21, Column 1)



1922

1923

1924

1925

1926

1927

1928

1929

1930

1931

1932

1933

1934

CURTIS

Refrigerating Machine Co.

Division of Curtis Manufacturing Co.

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518 H Hudson Terminal, New York City.

80 Years of Manufacturing Experience

40 Years of Compressor Building

12 Years' Experience in Producing Refrigerating Units

Curtis is one of the oldest and most experienced refrigeration equipment makers. And the Curtis line is one of the most complete lines available.

$\frac{1}{6}$ to 2 h.p. air cooled
 $\frac{1}{6}$ to 5 h.p. water cooled



Some desirable territories still open for reliable distributors. Write for details.

IF IT'S RUBBER-ask miller

MILLER'S technical staff has worked closely with every important manufacturer of refrigerators since the birth of the business. Developing special compounds for specific qualities, suggesting improvements in design, spotting possible economies, are daily routine with us. Strict professional respect for confidential data is always maintained.

REFRIGERATOR PARTS DEPT.

Miller Rubber Products Co., Inc.—Akron, Ohio

Donald Explains Nema Setup for Radio Parts Makers

(Concluded from Page 18, Column 5)

Next is insulating materials section.

Judge, if you think that there are any of these that should be read—

Mr. Neagle: I think the electronic tube section might be explanatory, because that is of real importance.

Mr. Van Allen: For my information, could I inquire as to whether these objections are to the inclusion of that in a proposed code? Is that the purpose of this testimony, objecting to those being included in a new code that we might have?

Deputy Cowling: I understand that they are filed in objection to the exemption.

Mr. Van Allen: Because the proposed code contains some clause that might include that?

Is that the purpose?

Deputy Cowling: I do not think so.

Mr. Delaney: You are only submitting these facts as reasons against the exemption as set forth in the petition, are you not, except where, as I said, they relate to provisions contained in the code?

Mr. Van Allen: I assume that these objections are directed to the inclusion of those products in any new code, the product that he is at present reading about.

Mr. Delaney: Right.

Mr. Van Allen: And what I wanted to find out is where the objection is based upon the inclusion of those products in any new code, or whether it is objected to that the rest of us should have a separate code.

Tube Industry Divisions

Mr. Donald: These all illustrate the general principle that was set forth this morning of the undesirability of a horizontal code.

If I may continue—

(a) While some industrial electronic tubes are used somewhat in the radio field, the great proportion of them, probably in excess of 95 per cent are used in fields other than radio.

(b) Similarly, large numbers of so-called radio tubes are now being used in the industrial or non-radio field. It is estimated that 10 to 15 per cent of so-called radio tubes now have a general purpose or use outside of the radio field.

It is our contention that no electrical product which has a general purpose or use should be included under any code other than the electrical manufacturing industry code.

(c) Inclusion of industrial electronic tubes under any other code than the Electrical Manufacturing Industry Code would be entirely illogical and would be thoroughly unsatisfactory in operation.

Industrial electronic tubes are sold with industrial electrical apparatus as part of such apparatus, and as replacement parts. Industrial electronic tubes are very closely identified in their application with the more general products of the electrical manufacturing industry, such as lighting, industrial control, welding, and other electrical manufacturing industry products.

(d) Members of the Industrial Electronic Tube section of Nema produce and sell in excess of 85 per cent of industrial electronic tubes.

Next is the insulating materials section, which cover Laminated Phenolic Products, Mica Insulation, Molded Insulation, and Saturated Sleeving.

Next, lightning arrester group of the

transformer section, covers lightning arresters of all kinds.

The Radio Receiving Tube Section.

The Radio Receiving Tube Section of the Electrical Manufacturing industry and of Nema embraces:

(a) Radio Receiving Tubes.

The facts and the objections of the Radio Receiving Tube Section of the electrical manufacturing industry and of Nema to exemption of the so-called radio manufacturing industry from the operations of the Electrical Manufacturing Industry code are as follows:

(a) Since the word "radio" is used in the name of this section we call attention to the fact that there is a duly organized section in Nema operating under the provisions of the electrical manufacturing industry code, and that such section is operating a published price system under Article X of the electrical manufacturing industry code.

(b) The members of the Radio Receiving Tube Section of Nema produce practically the entire output of radio receiving tubes. With the exception of Radio Corp. of America and possibly one other manufacturer of radio receiving sets for home use no radio receiving set manufacturer makes radio receiving tubes. Some radio receiving set manufacturers, have manufactured for them by others tubes bearing their own brands.

(c) With the exception of Radio Corp. of America and one other, manufacturers of radio and television receiving sets for home use are customers of manufacturers of radio receiving tubes.

(d) Radio receiving tubes are used without modification in telephone repeaters, speech input equipment, public address systems, talking picture equipment, and as amplifiers for industrial purposes.

The ninth classification is that of the Radio Transformer Group of the Specialty Transformer Section. It covers so-called radio transformers.

Objections of Specialty Transformer Group

The facts and the objections of the Radio Transformer Group of the electrical manufacturing industry and of Nema to exemption of the so-called radio manufacturing industry from the operations of the Electrical Manufacturing Industry code are as follows:

(a) Of all specialty transformers radio transformers comprise approximately 25 per cent.

(b) Of the radio transformer class of specialty transformers sold to radio receiving set manufacturers and for replacements, about 80 per cent are manufactured and sold by members of Nema.

(c) It is, we believe, essentially unsound to divide any product, such as transformers, and place part of them under one code and part under another. Such products are made at the same bench by the same workmen and sold by the same salesmen, for the most part by the same manufacturers.

(d) If radio transformers may be classified under a code such as the proposed radio manufacturing industry code, it would be equally consistent and equally unsound that other specialty transformers could be classified under other codes, with the result that electrical manufacturers would have to operate under as many codes as there are fields of use for

their products. It is obvious that this would be a highly undesirable condition, cause much misunderstanding, confusion and unnecessary expense, and make compliance with each of the codes practically impossible.

Commercial Receiving Apparatus Section

The tenth classification is the radio transmitting and public address and Commercial Receiving Apparatus Section. It covers Radio Transmitting apparatus, public address and music distribution apparatus, radio transmitter tubes and commercial radio receivers and both commercial radio receivers and direction finders.

Then follow some definitions, and we say this:

(a) Seventy per cent of the product of the entire product classification are manufactured by members of Nema, not including the products manufactured by RCA Victor Corp.

(b) In excess of 75 per cent of radio transmitter tubes and of radio transmitting apparatus is sold by members of Nema; 50 per cent of commercial radio receivers and direction finders is manufactured by members of Nema, not including the production of RCA Victor Corp.

(c) RMA has never performed any services for or included any activities for manufacturers of radio transmitting apparatus or radio transmitter tubes.

(d) The Supervisory Agency of this product classification under the electrical manufacturing industry Code Authority has issued a price call and is operating a published price system for radio transmitter tubes under Article X of the electrical manufacturing industry code.

(e) Commercial radio receiving sets and transmitter tubes and apparatus are often sold together in one self-contained unit and when separate units they are often parts of a single complete sending and receiving system, and should be under the same code of fair competition.

It would be quite difficult, if not entirely impossible, to divide such products so as to be under the jurisdiction of separate codes as to fair trade practices and labor provisions of such codes.

It would work a severe hardship on any manufacturer of radio receiving and transmitter tubes if he were obliged to function under one set of fair trade practices and terms of sale economically applicable only to radio receiving sets for home use, and at the same time function under another set of fair trade practices and terms of sale and labor provisions for radio transmitters sold either as part of a complete system or as separate units on the same job.

(f) Commercial Radio Receivers and transmitter tubes are in general not sold along the same lines or through the same distribution channels as radio receiving sets for home use.

Transmitting & Public Address Section Objects

(g) The Advisory Committee of the Radio Transmitting and Public Address and Commercial Radio Receiving Apparatus Section at a meeting on May 17, 1934, asked the Managing Director to address the following communication with respect to the proposed application for exemption by RMA, and this letter was forwarded to NRA on July 6, 1934, with the endorsement of the Board of Governors of Nema and of the Code Authority of the Electrical Manufacturing Industry.

"It is the understanding of the members of the Radio Transmitting, Etc. Section of Nema that the RMA is contemplating requesting the Administration at Washington to authorize a basic code for the radio industry to include, among other things, Radio Transmitting Apparatus, Public Address and Music Distribution Apparatus, Radio Transmitter Tubes and Commercial Radio Receivers and Direction Finders, all of which now come within the scope of the Radio Transmitting Section of Nema.

"In accordance with the consensus of opinion at the last Section meeting, the Advisory Committee in session at Nema headquarters today request that the Board of Governors of Nema, designated the Code Authority for the electrical manufacturing industry, formally protest to the NRA Administrator the inclusion in any other code of any of the products as manufactured and contained within the scope of this section.

"It is the opinion of this Committee that the Section represents well in excess of the majority of the productive capacity and sales of this type of equipment."

(h) At a meeting of the Radio Transmitting and Public Address and Commercial Receiving Apparatus Section on July 13, the action of the Advisory Committee and of the Board of Governors was unanimously approved by the members of the Section.

(i) The arguments presented above apply equally to the jurisdiction of codes of fair competition over public address systems, which include equipment for distribution of sound originating from radio receivers and electric phonographs in places other than homes.

(j) Radio transmitter tubes without modification are used for sound picture installations and telephone plants.

The eleventh classification is small rectifier and ignition battery testing equipment sections.

This covers Tungsten-Organ Rectifier Tubes.

The twelfth classification, Telephone Manufacturers' Section, covers head sets, cords and plugs, switchboards and jacks.

Thirteenth, varnished tubing, section, covers flexible varnished tubing.

The fourteenth, wiring device section, covers any product defined as sockets or receptacles, Tumbler, Toggle, Push Button or Snap Switches, or their accessories, Attachment Plugs or connecting outlet devices, Cord Sets for Resale, Decorative Lighting Outfits, and Fuses or Cutouts.

The fifteenth is the wire and cable section.

Products of Nema's Wire and Cable Section

The Wire and Cable Section of the electrical manufacturing industry and of Nema embraces the following products:

- (a) Cables,
- (b) Wires,
- (c) Power Coils,
- (d) Cords,
- (e) Cordage,
- (f) Magnet Wire,
- (g) Aerial Wire and equipment,
- (h) Lead-in Wire,
- (i) Cables and Harnesses,
- (j) Insulated Copper Wire.

The facts and the objections of the Wire and Cable Section of the electrical manufacturing industry and of Nema to exemption of the so-called radio manufacturing industry from the operations of the electrical manufacturing industry code are as follows:

(a) At least 90 per cent of all and of each of the products specified above are manufactured by members of the Wire and Cable Section of Nema.

(b) No manufacturers of radio receiving sets for home use manufacture such products.

(c) All of the products specified above are standard products and none of them are manufactured exclusively for radio purposes.

(d) The radio use of such products is very minor, almost negligible part of the total market for such products, with the exception of harnesses, which are purely matter of assembly and not of original production, and which are comparable to similar harnesses used in automobiles. None of the products specified, except harnesses, have any special feature, and in the case of harnesses the variation is entirely a matter of assembly and/or dimensions.

(e) Manufacturers of wire and cable strongly object to being classified as accessory manufacturers under any code.

(f) From the point of view of a manufacturer of this section of the electrical manufacturing industry and of Nema, a code proposing to cover all parts, cabinets and accessories for radio and television receiving sets for home use, including component parts thereof, would create a situation under which it would be impossible for a manufacturer to comply. All of the products of this section which might be interpreted to be included in the definition of the radio manufacturing industry are not made specially for radio application and a manufacturer of such items often does not know the ultimate destination or use of the products—certainly not when he manufactures them; often not even when he sells them to a distributor.

(g) Assemblers of wire and cable specialize made particularly for radio application and use are not representative of the wire and cable section of the electrical manufacturing industry.

Then we come to the summary.

The effect of exemption of the so-called radio manufacturing industry from the Electrical Manufacturing Industry code, in the form proposed by RMA on the wiring Device Section and the Wire and Cable Section of Nema, and indeed on all the other sections of Nema referred to in the previous section of this brief, illustrates conclusively the viciousness of the principle involved in horizontal codes set up in terms of the particular application of products, most of the products being used for many other general purposes and uses or applications.

In our opinion the Administrator for National Recovery should not countenance any such codes of fair competition. Indeed the difficulty of securing compliance, either under such horizontal codes or under the other codes with which they conflict, indeed the almost practical impossibility of securing such compliance, makes of such horizontal codes not codes of fair competition but rather codes of unfair competition.

After payment of all dividends, the surplus of the corporation was increased \$3,121,670 during the period and now stands at \$48,815,531.

I know, because I tried to administer one for a while.

Some people observe them in good faith; others violate them, on the ground that they are not covered, and you have just a hopeless situation.

Codes Should Be Based on Products, Not Purpose or Use

The only sound principles of code definition writing is that a code definition should embrace products and take jurisdiction over them irrespective of where or for what purpose or use or application they are sold.

Furthermore, the misunderstanding, the waste of time and effort and the expense which they create can be avoided only by refusal of NRA to approve any such codes.

Nema and the Code Authority for the electrical manufacturing industry, respectfully request that the application for exemption presented by the RMA should be denied by the Administrator for National Recovery.

Mr. Administrator, we beg leave to present a supplementary brief, if we should decide that it was desirable or necessary.

Westinghouse Receives \$33,655,032 Orders In Quarter

EAST PITTSBURGH, Pa.—Westinghouse Electric & Mfg. Co. report for the second quarter of 1934 shows orders received totaled \$33,655,022. This compared with \$20,237,588 for the previous quarter and \$17,557,964 for the second quarter of 1933. This report is for the entire Westinghouse company and not for the refrigeration division alone.

Sales billed for the second quarter of 1934 totaled \$27,287,545, compared to \$17,994,045 for the previous quarter and \$15,926,335 for the corresponding quarter of 1933.

Net profit for the quarter was \$1,744,427 compared to net loss of \$1,776,152 for the previous quarter and net loss of \$2,078,424 for the corresponding quarter of 1933.

C. I. T. Reports Profits of \$5,100,215 in 6 Months

NEW YORK CITY—With its volume of business and earnings exceeding those in any previous six months' period, Commercial Investment Trust Corp. reports for the six months ended June 30 consolidated net profits available for dividends of \$5,100,215 compared with \$2,799,582 for the first six months of 1933.

After dividends on the serial preference stock, earnings available for dividends on the common stock were \$4,679,731, equivalent to \$2.54 per share on the average number of shares outstanding in the hands of the public during the period. This compares with \$2,235,384 equivalent to \$1.12 per share in the average number similarly outstanding during the six months ended June 30, 1933.

After payment of all dividends, the surplus of the corporation was increased \$3,121,670 during the period and now stands at \$48,815,531.

ALL TYPES

Yes, we have in stock, all types of standard fittings for the automatic refrigeration business.

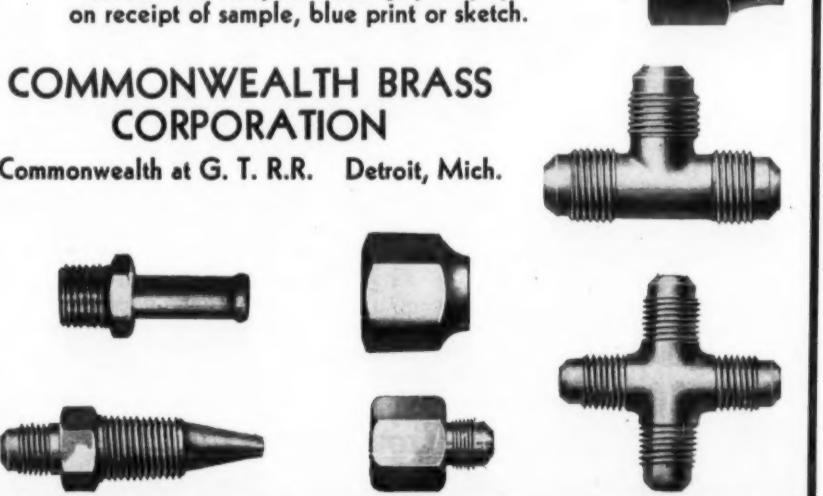
Having grown with the industry from its inception we have specialized on "Seepage-Proof" fittings, for every refrigeration need.

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Quotations on special fittings promptly on receipt of sample, blue print or sketch.

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a product of guaranteed Uniformity; Reliability, in which both moisture and acidity are reduced to the minimum. Refined and tested in conformity with our unvarying high standards. V-METH-L is shipped in containers holding 1200, 90, 6 and 3½ pounds . . . ready for direct charging from our "orange cylinders" to your machine. Stocks are available at convenient distributing points.

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F. A. Eustis, Sec'y, Virginia Smelting Co., 131 State St., Boston, Mass.
Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.
Folder: Extra Dry ESOTOO (Liquid Sulphur Dioxide)
Folder: V-METH-L (Virginia Methyl Chloride)
Folder: Transferring from large to small cylinders
Circular: Physical properties of various refrigerants

Name _____
Street & No. _____
City & State _____

SERVICE

How to Adjust & Replace U. S. Hermetic Electrical Parts

(Concluded from Page 19, Column 5) amount the cabinet is used, the running time should be between 50 and 75 per cent of the time in a 100° room, and between 25 and 35 per cent of the time in a room temperature of 70°.

D.—Unit Will Not Run

1. Overload Throws Switch Out. The thermostat contains a circuit breaker or overload mechanism. The functioning of the overload automatically turns the switch lever to the "Off" position.

If, after turning the switch lever on, it is automatically turned off, some abnormal condition is indicated. It requires from a few seconds to five minutes for the overload mechanism to function, depending on the extent of the overload.

Before turning the switch on after the overload mechanism has functioned, allow sufficient time for the solder in the mechanism to cool. This requires about one minute.

Before doing anything else, check the voltage. Although the unit is designed to start on a range from 90 to 145 volts, this range is only for the purpose of starting the unit under temporarily abnormal conditions.

The power company should maintain the voltage within 10 per cent of the standard, which is 110 to 115 volts. If the voltage is 10 per cent above or 10 per cent below the standard, call the power company about it.

Though you will seldom find the trouble to be caused by improper voltage, it is logical to check it first, because if the voltage is causing the switch to be thrown off, the work of changing electrical parts or of changing the unit would be saved.

If the voltage is satisfactory, check the wiring for short circuits. First, pull the plug at the baseboard socket, to avoid the possibility of a shock. Inspect the four wire connections on the compressor. These are soldered connections, and care should be used in inspecting them so as not to loosen them.

Next, remove the cover from the relay and examine the wire connections in the relay junction box. If these connections are satisfactory, insert the plug in the baseboard socket, and turn the switch lever on and observe the action of the rocker arm.

Provided there are no undiscovered short circuits or other defects in the unit, the relay rocker arm will go to the starting position, and then the unit will start. The rocker arm should then immediately move into the running position.

Check the action by switching the unit on and off several times. If the rocker arm does not move to its running position, assist it with an insulated pointer. In touching the rocker arm of the relay, be careful not to disturb its adjustment. See "Adjustment of Relay."

If it remains in the running position, and the unit seems to be running satisfactorily, change the relay. If the rocker arm will not stay in the running position, but returns to the starting position, overload of the compressor is indicated.

It may be temporarily due to high pressure caused by a very hot room, box, and unit. This condition can readily be overcome by restarting the unit several times, giving it a chance to overcome the unusual starting conditions.

If the rocker arm in its starting position does not start the unit, providing the wiring has been inspected satisfactorily, the trouble may be in the condenser unit. As there are no moving parts in the condenser unit, it will seldom be found to be defective.

A defective condenser unit might be indicated by a buzzing noise in the condenser unit, or by the insulating compound inside the unit overflowing through the top. A defective condenser unit will cause an excessive current drain and the overload will throw the switch off.

2. Switch Stays On. If the trouble is not discovered in the general inspection, test the thermostat by removing connector cap from thermostat, and attaching cap to another thermostat which you know to be in working order. If this starts the unit, change the thermostat.

If the unit still does not start, change the relay. If this does not correct the trouble, change the condenser unit.

E.—Electric Light Not Operating

If the general inspection does not correct the trouble, change the electric light switch.

F.—Unit Making Undue Noise

Noise should not be judged until the refrigerator is thoroughly cooled down and is running normally. Undue noises from the unit may be caused by tubing bent out of place, or screws may be loose.

See that fan blades are in alignment within 1/32 in., and not bent and that fan blades are not loose on the shaft. If fan motor is noisy, change fan motor. A buzzing relay or condenser unit should also be changed. The baffle in the machine compartment should not touch the radiator.

Adjustments

The Adjustment of the Thermostat

The temperature of the food chamber should be between 45 and 50° F. depending on the temperature of the outside air. That is to say, with a room temperature of 100° the box temperature should be close to 50° F.

Temperature Adjustment

For normal operation, the dial pointer should be set in the mid position of the dial. The temperature range may be raised by turning the dial pointer to the left, or lowered by turning to the right. The total adjustment of the temperature range by changing the dial pointer the full length of the dial is approximately 10°.

Changing the position of the dial pointer does not change the differential. When it is necessary to change the temperature range beyond the limit of the pointer movement a further adjustment may be made as follows:

To lower temperature range—Turn the dial pointer to the position at the extreme right. Remove the nameplate screw, and take the nameplate off of the range adjusting screw, then replace it with the dial pointer at the No. 1 position of the dial. This procedure will lower the temperature range approximately 5° F. from its previous setting with the dial pointer at the No. 1 position.

To raise temperature range—Move the dial pointer to the extreme left position. Remove the nameplate screw and take the nameplate off the range adjusting screw, then replace it with the dial pointer at the No. 1 position of the dial. This procedure will raise the range approximately 5°.

Caution—If the nameplate is removed for any reason other than temperature adjustment one should observe the position of the dial pointer so that replacement may be made in exactly the same position, otherwise, the temperature range will be changed.

Overload

The thermostat also contains a circuit breaker or overload mechanism. The functioning of the overload mechanism automatically turns the switch lever to the "Off" position. To start the unit it is necessary to push the switch lever all the way down, allowing it to return part way.

After the automatic overload has functioned, allow sufficient time for the solder in the overload mechanism to cool before turning the switch lever to the "On" position. The time required is about one minute.

Overload Switch Out of Place

Frequent tripping of the overload mechanism indicates some abnormal condition. The voltage should first be checked. The power company should not allow the voltage to vary more than 10 per cent from the standard which is 110 to 115 volts.

Normal Cycles

Providing the ice trays are all frozen and the food in the cabinet has been brought down to temperature and the door of the box has been closed, the normal running cycle of the unit should be about 15 minutes. The unit will then be off from half an hour to 15 minutes, depending on the room temperature.

In a cool room, the running time of the machine will tend to be less than 15 minutes, or about 10 minutes. In a warm room, the running time will be over 15 minutes, or about 20 minutes.

When the box is being used and the door is being opened occasionally, food being moved in and out, and water placed in the trays, the running cycles will, of course, be longer.

Short Cycles

Short cycles denote short running periods. Short cycles may be due to the capillary tube of the thermostat touching some point of the cooling unit colder than the bulb, or to a defective refrigerating unit. Or, the differential adjustment may be too close.

Long Cycles

Long cycles denote long running periods. Long cycles may be due to the thermostat having its range adjustment so low that the machine operates ineffectively. Long cycles

Wiring Chart for U. S. Hermetic

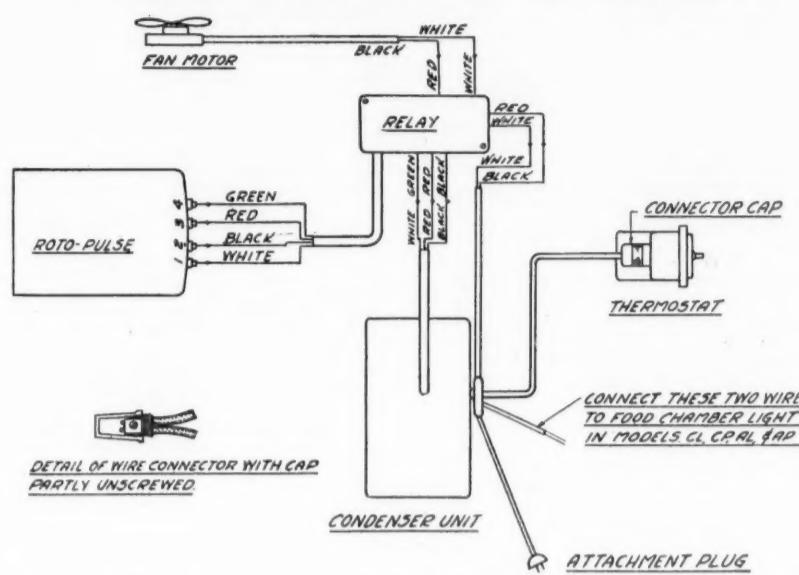


Fig. 2. Wiring diagram of electrical parts in the U. S. Hermetic, giving the coloring scheme which is used to identify the various leads.

may also be caused by the thermostat bulb being loose in the clamp, or differential adjustment of thermostat being too great.

Will Not Cut-In

The cutting in of the thermostat will not start the motor unless the switch lever is in the "On" position. Cutting-in of the thermostat will not start the unit when there is an open circuit in the wiring.

Will Not Cut-Out

The thermostat will not cut-out if the temperature range is set below the ultimate limit of the refrigerating system, or when the refrigerating unit is defective to the extent that the cooling unit temperature cannot be lowered sufficiently. A short circuit in the wire connected to the thermostat will prevent the unit from being stopped by the operation of the thermostat.

Differential Adjustment of Thermostat

The proper differential setting is made at the factory, and should not be adjusted in the field, but if found to be defective the thermostat should be returned to the factory for exchange.

Too short or too long operating cycles usually indicate an improper adjustment of the differential, but other things such as a defective refrigerating unit, or the capillary tube of the thermostat touching some point of the cooling unit colder than the bulb, or by the bulb being too loose in the clamp might also cause too short or too long cycles.

Provided the temperature of the box is satisfactory, too long cycles may cause the frost on the cooling unit to melt off too much between running periods causing ice rather than frost to form on the cooling unit.

If you are sure you understand all the factors involved, and have decided that the differential is out of adjustment, proceed as follows:

To increase the differential turn the differential adjusting screw counter clockwise. To decrease the differential turn the differential adjusting screw clockwise.

Turning the differential adjusting screw does not affect the cut-out temperature setting, but it does change the cut-in temperature approximately $2\frac{1}{2}$ ° F. for each complete turn of the differential adjusting screw.

In order to better understand the differential adjustment, and to distinguish it from the range adjustment, let us say the unit cuts in when the temperature at the bulb is 30°, and cuts out at 20° F.

By changing the differential setting, we may cause it to cut in at 25° or 35° F., but we do not effect the temperature of 20° at which the unit cuts out. Changing the range adjustment, raises or lowers both the cutting in and cutting out temperatures simultaneously; that is, if these temperatures are 20° and 30° F. respectively they can be changed to 15° and 25° F. or to 25° and 35° F.

If the cycles are too short and the temperature of the cabinet is satisfactory, and the capillary tube is not touching the cooling unit at some point colder than the bulb increase the differential. If this does not correct the trouble, the refrigerating unit is defective, and should be returned to the factory.

If the temperature of the box is satisfactory, and the thermostat bulb is not loose in the clamp and the cycles are too long, decrease the differential.

Caution—If a change in the thermostat adjustment is considered necessary do not change the differential adjustment until you are sure the range adjustment is correct.

The range adjustment is determined by checking the temperature of the box which should be between 45 and 50° F., depending on the outside temperature of the air.

The wires in the junction box are connected as follows:

Connect red wire inside relay box to red wire from condenser unit, black wire from fan and black wire from main power supply all together. Connect white wire inside relay box, white wire from fan, and white wire from main power supply all together.

Connect black wire inside relay box to black wire from condenser unit. Connect green wire inside relay box to white wire from condenser unit. Wire connectors should be used, but if lost, broken, or mislaid, solder the connection and insulate with tape.

Looking at the four terminal plugs from in front of the cabinet or unit, and numbering the plugs from left to right, connect white wire to plug No. 1—black to No. 2—red to No. 3—green to No. 4.

These wires must be soldered to terminal plugs being careful not to let wire or solder touch the steel jacket around the terminal plug, otherwise, a short circuit or ground will be caused.

To Change Condenser Unit

Note—Remove plug from baseboard socket before changing condenser unit.

1. Disconnect wires from relay.

2. Attachment cord is clamped to condenser unit and must be removed.

3. Take out three screws securing condenser unit to the base, and remove. In replacing condenser unit refer to wiring diagram.

To Change Fan Motor

1. Disconnect wiring from relay.

2. Remove fan blades from fan motor. (Fan blades should be straightened so that blades run true within not more than 1/32 in.)

3. Take out two screws which fasten motor bracket to base and remove fan motor. (Care should be taken not to damage the coils or bend the shaft of the fan motor. Removal and replacement are facilitated by loosening three screws holding down the radiator.)

4. Remove fan motor bracket, which is fastened with two screws, from fan motor and place on new fan motor.

In replacing fan motor refer to wiring diagram in order to make proper connections.

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For commercial display cabinets. Doors...Door Frames...Slide Rails...Jams...Glazing Strips...Trim...Many standard and special sizes and parts...

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COMMERCIAL EVAPORATORS

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CONDENSERS

METFLIX ICE TRAYS

SPIRAL FINNED TUBING

SPIRAL COPPER FINNED IRON,

STEEL OR COPPER PIPE

McCORD RADIATOR & MFG. CO.

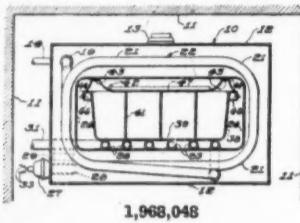
DETROIT, MICH.

PATENTS

Issued July 31, 1934

1,968,048. EVAPORATOR FOR REFRIGERATORS. George W. Mason, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application April 11, 1929. Serial No. 354,348. 14 Claims. (Cl. 62—95)

5. A refrigerant evaporating unit comprising a heat retaining medium having a refrigerant expansion coil disposed in-



1,968,048

ternally thereof, and a refrigerant expansion coil disposed externally of the medium in metallic heat conductive relationship thereto.

1,968,049. HEAT TRANSFER AND REFRIGERATION. Thomas Midgley, Jr., Worthington, Albert L. Henne, Columbus, and Robert R. McNary, Dayton, Ohio, assignors, by mesne assignments, to General Motors Corp., a corporation of Delaware. Original application Feb. 8, 1930. Serial No. 426,974. Divided and this application November 19, 1931. Serial No. 576,052. 2 Claims. (Cl. 62—178)

1. The method of transferring heat which comprises condensing and subsequently evaporating CH_3ClF .

1,968,050. HEAT TRANSFER AND REFRIGERATION. Thomas Midgley, Jr., Worthington, Albert L. Henne, Columbus, and Robert R. McNary, Dayton, Ohio, assignors, by mesne assignments, to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Original application Nov. 19, 1931. Serial No. 576,052. Divided and this application April 30, 1934. Serial No. 723,278. 2 Claims. (Cl. 62—178)

1. The method of transferring heat which comprises condensing and subsequently evaporating any of the following derivatives of methane: CHClF_2 ; CClF_3 and CCl_2F .

1,968,183. MULTILAYER FROZEN COMESTIBLE PRODUCT. Clarence W. Vogt, Louisville, Ky., assignor by mesne assignments, to Vogt Processes, Incorporated, Louisville, Ky., a corporation of Delaware. Application Sept. 19, 1931. Serial No. 563,804. 2 Claims. (Cl. 62—174)

1. The method of preparing and packing a multilayer frozen comestible, which includes placing in a container a pair of spaced superhard prefrozen layers of said comestible, delivering between said blocks a layer of a softer comestible frozen to a less extent, and hardening the second mentioned layer by heat transfer within said container during the equalization of the temperature of the separate layers the temperature of the first mentioned layers being sufficiently low to effect such hardening.

1,968,184. AIR CONDITIONER. John H. Voss and Harry A. Steinmeyer, Chicago, Ill. Application June 24, 1932. Serial No. 619,154. 9 Claims. (Cl. 261—10)

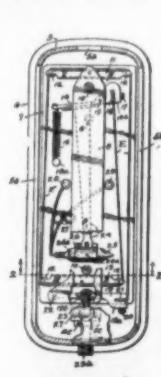
5. In combination, a housing for containing a liquid, a mixing chamber wherein the air is mixed with the liquid, means for separating the liquid from the air and discharging the air and liquid upon the liquid contained in the housing, air conduits surrounded by the liquid substantially over their whole length and communicating with said separating means, a liquid pump having connections for pumping said liquid to the mixing chamber and an air circulating device having its intake connected to said conduits, and its discharge leading to the space which is to receive the treated air.

1,968,195. CONGEALING SOLUTION. Joseph Fleischer, Dayton, Ohio, assignor to Frigidaire Corp., Dayton, Ohio, a corporation of Delaware. No drawing. Application April 28, 1932. Serial No. 608,139. 4 Claims. (Cl. 252—5)

1. A freezing hold-over solution comprising a salt solution suspended in an agar agar gel.

3. A composition of matter comprising an aqueous salt solution in substantially cryohydrate composition, having added thereto a small amount of an additional solute to permit freezing of most of the salt at temperatures close to and slightly below the cryohydrate temperature, while preventing the freezing of the last traces of the solution until a low temperature has been reached, said composition being suspended in a jelled body.

1,968,301. HUMIDITY REGULATOR. Carroll E. Lewis, St. Paul, Minn., assignor to Lewis Air Conditioners, Inc., Min-



1,968,301

neapolis, Minn., a corporation of Delaware. Application March 3, 1930. Serial No. 432,932. 6 Claims. (Cl. 297—1)

1. In a humidity regulator, a support

an actuating lever pivoted adjacent one end of said support, means for yieldingly urging said lever in one direction, a series of rectangularly arranged guides, projecting outwardly from the face of said support, an elongated flexible element expandable and contractible with variations in the humidity of the air, said element being wrapped around said guides and held in substantially annular arrangement thereby surrounding said actuating lever, one end of said element being anchored, the opposite end being secured to said actuating lever and means for multiplying the movement of said actuating lever rigidly connected therewith.

1,968,318. APPARATUS FOR PRODUCING SOLID CARBON DIOXIDE. Arthur Seligmann, Dusseldorf, Germany. Application Jan. 15, 1932. Serial No. 586,769. In Germany Jan. 17, 1931. 10 Claims. (Cl. 62—121)

1. The method of pre-cooling liquid carbon dioxide and separating lubricant and foreign matter therefrom which comprises introducing liquid carbon dioxide at the bottom of a chamber, conducting the liquid carbon dioxide from the top of said chamber through a liquid carbon dioxide containing and expansion vessel in heat exchange relationship to liquid carbon dioxide contained in said vessel, then conducting the liquid carbon dioxide through said chamber in heat exchange relationship to the liquid carbon dioxide supplied to said chamber, and finally discharging the supplied liquid carbon dioxide into said vessel.

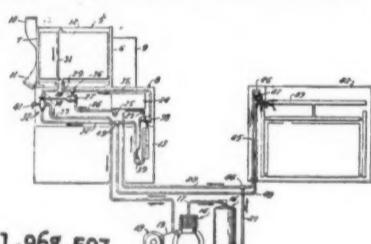
2. In apparatus for producing solid carbon dioxide, a vessel to receive liquid carbon dioxide, a solidifying chamber connected to said vessel to receive liquid carbon dioxide therefrom, a separator chamber adjacent to said vessel, means for the delivery of liquid carbon dioxide to a bottom part of said separator chamber, a conduit extending from a top part of said separator chamber into said vessel and submerged in liquid carbon dioxide therein, said conduit extending from the vessel into the separator chamber and being submerged in liquid carbon dioxide therein, said conduit finally extending from the separating chamber into the vessel to discharge therein, and a valve in the last mentioned portion of said conduit between the separating chamber and the vessel.

1,968,504. PROCESS AND APPARATUS FOR STORING LIQUID CARBON DIOXIDE. Hans Rufener and Theophil Eichmann, Bern-Liebefeld, Switzerland, assignors to International Carbonic Engineering Company, Kennett Square, Pa., a corporation of Delaware. Application Dec. 6, 1933. Serial No. 701,244. In Switzerland May 29, 1933. 9 Claims. (Cl. 62—170)

1. In a process of storing liquid carbon dioxide in a storage container; expanding high pressure liquid carbon dioxide prior to its discharge into the container down to a pressure and temperature condition at which the vapor over the liquid in the container has a specific volume greater than the specific volume of the vapor that would be over the high pressure liquid carbon dioxide; and during discharge of such expanded liquid carbon dioxide into the storage container continuously withdrawing the vapors formed by the expansion from the storage container to maintain the temperature and pressure conditions on the liquid in the container.

1,968,507. REFRIGERATING SYSTEM FOR ICE CREAM FREEZERS. James T. Smith, Chicago, Ill., assignor to Mills Novelty Co., Chicago, Ill., a corporation of Illinois. Application Feb. 29, 1932. Serial No. 595,685. 6 Claims. (Cl. 62—115)

1. In an ice cream freezing system the combination of a freezer, including a cream chamber and a compartment asso-



1,968,507

ciated therewith for receiving a refrigerating medium, an ice cream hardening unit and a cooling element therefor, a compressor, a condenser associated with said compressor, connections for supplying liquid refrigerant from said condenser to the freezer and hardening units, vapor return lines for conducting vaporized refrigerant from said units to the compressor, and valve mechanism interposed in said return lines for simultaneously opening one of the returns and closing the other, thereby permitting isolation of either the freezer or the hardening unit from the system and rendering the entire capacity of the condenser available for the unit remaining in the system.

1,968,508. APPARATUS FOR PREVENTING ACCUMULATION OF OIL IN COOLING COMPARTMENT OF ICE CREAM FREEZERS. James T. Smith, Chicago, Ill., assignor to Mills Novelty Co., Chicago, Ill., a corporation of Illinois. Application Feb. 29, 1932. Serial No. 595,844. 6 Claims. (Cl. 62—114)

1. Apparatus of the character described comprising, in combination, a freezer provided with a compartment for receiving a refrigerating medium, a compressor, a condenser associated with said compressor, connections for conducting liquid refrigerant from said condenser to the freezer and for returning vaporized refrigerant from the freezer to the compressor, means for interrupting the flow of refrigerant vapor from the freezer, and means, including a heat exchange element and an expansion valve associated therewith, providing a path whereby liquid refrigerant, and any oil entrained therewith, remaining in the freezer upon stoppage of flow of refrigerant vapor therefrom, may be removed from the freezer and conducted through said exchange element and the expansion valve to the suction compartment of the compressor, thereby preventing accumulation of oil in the refrigerant compartment of the freezer.

1,968,543. METHOD OF AND APPARATUS FOR REFRIGERATING MATERIALS. Louis N. Udell, Boston, Mass. Application July 29, 1931. Serial No. 553,716. 23 Claims. (Cl. 62—104)

1. A method of refrigeration, which consists in packing the goods to be refrigerated in a pan having a dished cover, pouring a liquid refrigerant into said cover and permitting the refrigerant to overflow therefrom at a fixed level whereby to maintain in said cover body of refrigerant of constant depth, and simultaneously subjecting the side and bottom walls of said pan to contact with a body of liquid refrigerant including overflow from said cover.

1,968,654. REFRIGERATOR. Fay T. Rodgers, Memphis, Tenn. Application Jan. 6, 1932. Serial No. 650,538. 4 Claims. (Cl. 312—138)

1. A refrigerator having top wall with a substantially plane top surface, and a substantially vertical rear wall, said rear wall being rectangularly cut away to form a doorway, said cut extending to, and full depth across said top wall, whereby access to the interior of said refrigerator is promoted, and a door, substantially of equal thickness with said rear wall, housed within said doorway and extending upward across said top wall, the end of said door forming part of said top surface.

1,968,778. AIR WASHER AND DEHUMIDIFIER. William J. Caldwell, Kansas City, Mo., assignor to J. H. McCormick & Co., Williamsport, Pa., a corporation of Pennsylvania. Application April 25, 1930. Serial No. 447,252. Renewed Jan. 8, 1934. 5 Claims. (Cl. 183—23)

1. In an air washer and dehumidifier a plurality of sprays, an air supply intake to pass the air against the stream of one



1,968,778

of said sprays and against the stream of another of said sprays, moisture eliminators adapted and arranged to remove excess moisture from said air, baffles between said sprays and said moisture eliminator adapted and arranged to shield said moisture eliminator, and means to dehumidify said air, substantially as described.

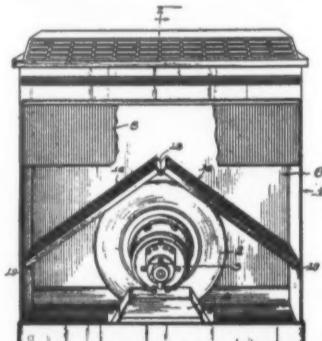
1,968,780. MILK COOLER. John George Kaestner, Baltimore, Md., assignor to The E. A. Kaestner Co., Baltimore, Md., a corporation of Maryland. Application July 2, 1931. Serial No. 548,424. 3 Claims. (Cl. 257—179)

2. Apparatus for treating milk including a unit having a filler embodying a pair of substantially similar transversely corrugated metal vertical plates welded together at the meeting portions of their inner faces to prove a vertical series of internal horizontal treating fluid passages, said plates at their exteriors providing undulating surfaces down which the milk exteriorly flows, said corrugated plates providing each end of said unit throughout the vertical length of the unit with a pair of vertical outwardly diverging flanges; and box-like vertical end headers for said filler, said headers at their inner vertical sides receiving said flanged ends of the filler and being united thereto by the filler ends, said headers forming vertical internal treating fluid chambers outwardly beyond said filler ends and into which the ends of said fluid passages open.

Reissue

19,260. AIR FILTER FOR HEATING AND VENTILATING UNITS. Wilfred Shurtliff, Moline, Ill., assignor to The Herman Nelson Corp., Moline, Ill., a corporation of Illinois. Original No. 1,887,737, dated Nov. 15, 1932. Serial No. 23,523, April 16, 1925. Application for reissue Nov. 16, 1933. Serial No. 698,281. 15 Claims. (Cl. 257—137)

2. In a heating and ventilating unit of the character described, the combination of a housing having an inlet adjacent its



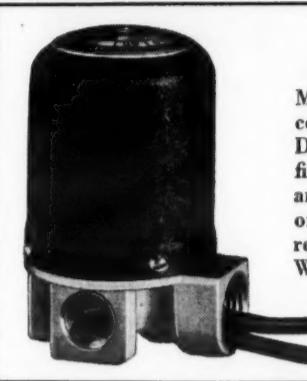
19,260

bottom and an outlet adjacent its top, a fan in the bottom of said housing adapted to draw air from the adjacent opening and to discharge said air upwardly; of means in the upper end of said housing for conducting vaporized refrigerant from said unit to the compressor, and valve mechanism interposed in said return lines for simultaneously opening one of the returns and closing the other, thereby permitting isolation of either the freezer or the hardening unit from the system and rendering the entire capacity of the condenser available for the unit remaining in the system.

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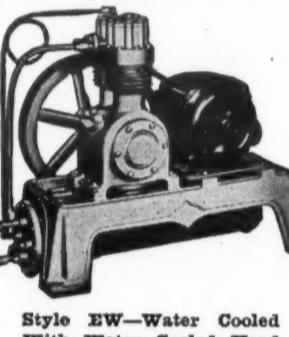


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